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APPENDIX TO THE JOURNALS
OF THE
SENATE AND ASSEMBLY

OF THE
TWENTY-THIRD SESSION

OF THE
LEGISLATURE OF THE STATE OF CALIFORNIA.

Volume I.



SACRAMENTO:
STATE OFFICE : : : F. P. THOMPSON, SUPT. STATE PRINTING.
1879.

THE END OF THE WORLD

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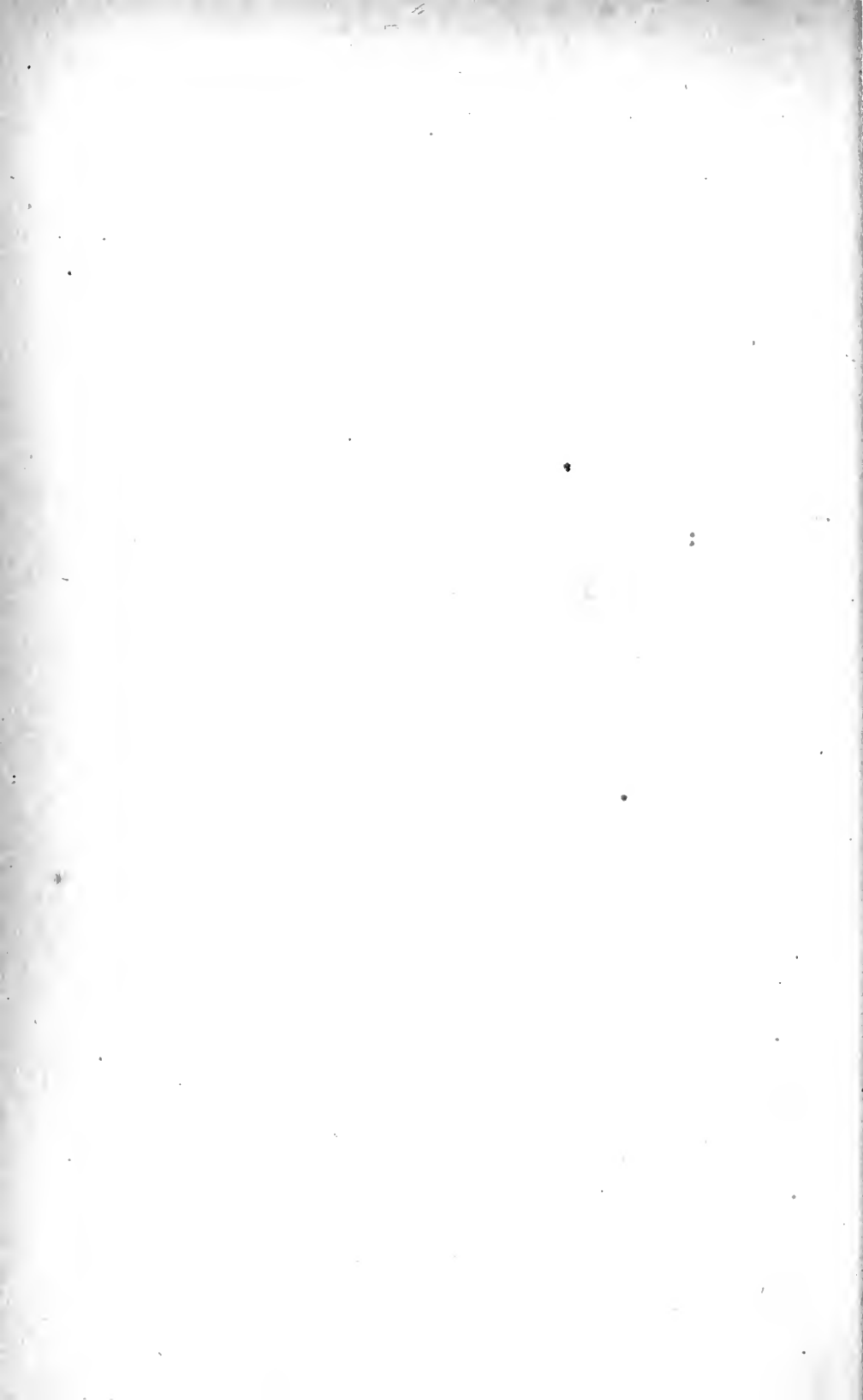
BIENNIAL REPORT

OF THE

SECRETARY OF STATE

FROM

JULY 1st, 1877, TO JUNE 30th, 1879.



REPORT.

STATE OF CALIFORNIA, DEPARTMENT OF STATE, }
SACRAMENTO, July 10th, 1879. }

To His Excellency, William Irwin, Governor of the State of California:

SIR: In accordance with the requirements of Section 408 (sub-division 17), Political Code, I have the honor to submit the following report of the transactions of this department for the 29th and 30th fiscal years, commencing July 1st, 1877, and ending June 30th, 1879.

Very respectfully,

THOMAS BECK,
Secretary of State.

STATEMENT

Of the amounts received for fees, sale of Codes, California Reports, copies of Geological Survey, ballot paper, Statutes and Amendments to the Codes, 1877-8, from the date of my last report, July 1st, 1877, to June 30th, 1879, being for the 29th and 30th fiscal years.

Fees received during the month of July, 1877.....	\$784 00
Fees received during the month of August, 1877.....	762 00
Fees received during the month of September, 1877.....	816 00
Fees received during the month of October, 1877.....	1,027 00
Fees received during the month of November, 1877.....	988 25
Fees received during the month of December, 1877.....	1,160 75
Fees received during the month of January, 1878.....	991 75
Fees received during the month of February, 1878.....	959 75
Fees received during the month of March, 1878.....	952 75
Fees received during the month of April, 1878.....	1,297 00
Fees received during the month of May, 1878.....	984 25
Fees received during the month of June, 1878.....	776 25
Fees received during the month of July, 1878.....	852 75
Fees received during the month of August, 1878.....	1,174 25
Fees received during the month of September, 1878.....	1,316 75
Fees received during the month of October, 1878.....	1,328 50
Fees received during the month of November, 1878.....	1,057 25
Fees received during the month of December, 1878.....	705 75
Fees received during the month of January, 1879.....	610 75
Fees received during the month of February, 1879.....	751 00
Fees received during the month of March, 1879.....	972 25
Fees received during the month of April, 1879.....	683 00
Fees received during the month of May, 1879.....	625 25
Fees received during the month of June, 1879.....	597 50
Total amount of fees received.....	\$22,174 75
Received from sale of Codes.....	\$17 50
Received from sale of Geological Survey.....	95 00
Received from sale of California Reports.....	15 00
Received from sale of Constitution of California.....	1 00
Received from sale of ballot paper.....	4,874 71
Received from sale of Statutes and Amendments to Codes, 1877-8.....	92 00
Received from sale of old copper.....	20 30
	5,115 51
Total receipts for the 29th and 30th fiscal years.....	\$27,290 26

STATEMENT—Continued.

Paid into the State treasury, August 2d, 1877		\$784 00
Paid into the State treasury, September 3d, 1877		762 00
Paid into the State treasury, October 5th, 1877		816 00
Paid into the State treasury, November 6th, 1877		1,027 00
Paid into the State treasury, December 10th, 1877		988 25
Paid into the State treasury, January 10th, 1878		1,160 75
Paid into the State treasury, February 8th, 1878		991 75
Paid into the State treasury, March 11th, 1878		959 75
Paid into the State treasury, April 11th, 1878		952 75
Paid into the State treasury, May 8th, 1878		1,297 00
Paid into the State treasury, June 6th, 1878		984 25
Paid into the State treasury, July 5th, 1878		776 25
Paid into the State treasury, August 7th, 1878		852 75
Paid into the State treasury, September 19th, 1878		1,174 25
Paid into the State treasury, October 4th, 1878		1,316 75
Paid into the State treasury, November 11th, 1878		1,328 50
Paid into the State treasury, December 3d, 1878		1,057 25
Paid into the State treasury, January 7th, 1879		705 75
Paid into the State treasury, February 12th, 1879		610 75
Paid into the State treasury, March 7th, 1879		751 00
Paid into the State treasury, April 8th, 1879		972 25
Paid into the State treasury, May 6th, 1879		683 00
Paid into the State treasury, June 7th, 1879		625 25
Paid into the State treasury, July 5th, 1879		597 50
Total paid into the Library Fund		\$22,174 75
Paid Treasurer, for sales of Codes, October 4th, 1878	\$10 00	
Paid Treasurer, for sales of Codes, January 7th, 1879	5 00	
Paid Treasurer, for sales of Codes, April 7th, 1879	2 50	
		17 50
Paid Treasurer, for sales of Geological Reports, July 5th, 1878	\$85 00	
Paid Treasurer, for sales of Geological Reports, October 4th, 1878	5 00	
Paid Treasurer, for sales of Geological Reports, April 7th, 1879	5 00	
		95 00
Paid Treasurer, for sales of California Reports, October 4th, 1878		15 00
Paid Treasurer, for sale of copy of Constitution, April 7th, 1879		1 00
Paid Treasurer, for sales of ballot paper, October 5th, 1877	\$3,876 25	
Paid Treasurer, for sales of ballot paper, January 2d, 1878	180 36	
Paid Treasurer, for sales of ballot paper, July 5th, 1878	418 90	
Paid Treasurer, for sales of ballot paper, October 4th, 1878	115 00	
Paid Treasurer, for sales of ballot paper, January 7th, 1879	14 00	
Paid Treasurer, for sales of ballot paper, April 7th, 1879	68 40	
Paid Treasurer, for sales of ballot paper, July 5th, 1879	201 80	
		4,874 71
Paid Treasurer, for sales of Statutes and Amendments, 1877-8, October 4th, 1878	\$57 00	
Paid Treasurer, for sales of Statutes and Amendments, 1877-8, January 7th, 1879	14 00	
Paid Treasurer, for sales of Statutes and Amendments, 1877-8, April 7th, 1879	18 00	
Paid Treasurer, for sales of Statutes and Amendments, 1877-8, July 5th, 1879	3 00	
		92 00
Paid Treasurer, for sale of lot of old copper, July 5th, 1879		20 30
Total amount paid into State treasury for the 29th and 30th fiscal years		\$27,290 26

The foregoing statement shows the receipts of the office for fees during the preceding two years, commencing July 1st, 1877, and ending June 30th, 1879, to be the sum of \$22,174 75. By reference to the biennial report of my predecessor for the corresponding term of two years, commencing July 1st, 1873, and ending June 30th, 1875, it appears that the receipts of the office for fees was the sum of \$16,729 60, showing an increase during the two years last past of \$5,445 15, making a grand total of \$15,332 increase during the three years and seven months of my term over that of my predecessor for the corresponding term.

The fees received by me, as above reported, were for the following services, viz.:

For filing and recording 1,305 certified copies of articles of incorporation and issuing certificates thereon	\$12,723 75
For issuing 719 commissions to Notaries Public	3,595 00
For issuing 52 commissions to Commissioners of Deeds	260 00
For filing and recording 17 official bonds	85 00
For issuing certificates of official character and other certificates, making copies of laws and other documents and records, attesting and entering warrants of arrest, land patents, and various other miscellaneous business	5,169 00
Total	\$22,174 75

CONCERNING CORPORATION PAPERS.

When I assumed the duties of Secretary of State the papers relative to corporations filed in the office were arranged in alphabetical order, in boxes prepared for that purpose, but owing to their rapid increase, and the large preponderance of some of the letters over others, the papers had got so badly mixed up that it was, in many instances, very difficult to find such as were wanted, and the indexes, being very incomplete and very carelessly made up, we were frequently occupied for days at a time searching the files to ascertain if certain articles of incorporation and other papers relating to corporations (of which we had received letters of inquiry) were on file in the office, and the delay necessarily caused in answering these letters had, in many instances, caused much dissatisfaction at our seeming want of promptness. Owing to the time occupied in making searches in this office, their unsatisfactory character when made, and the delay in giving parties information or copies when required, I concluded that the interests of the State would be served much better by having new and complete indices made and the mode of arranging the papers changed. Accordingly I had a general index prepared, with headings showing the number of the paper filed, name of the corporation, date of filing, and where recorded. The papers were all numbered (commencing with one), properly entered in said index, and filed away in boxes with the numbers indorsed thereon. By this method I have gained considerable room, got the papers arranged in such a manner that in future there need be no confusion or mixing up, and in such a compact and convenient shape that they can be readily found without loss of time, and by looking over the Index Book any person can now tell at a glance whether any particular corporation has filed its articles or not. The Secretary of State, also, can now certify with some degree of certainty relative to such matters. The indexing, numbering, and arranging of all the articles of incorporation and other papers relating to corporations, filed in this office from the commencement of the State government up to the present time, was no light job, and necessarily required much time, with great care and close attention; but I think the increased facilities for a correct searching of the papers will much more than compensate for the time and labor expended in doing the work.

THE CODES.

The transactions in California Codes for the last two years have been very light, there being but few sold or distributed. The follow-

ing is a summary of what has been done since the date of my last biennial report:

Number of volumes on hand July 1st, 1877	919
Number of volumes distributed since	16
Number of volumes sold	7
	<u>23</u>
Number of volumes on hand July 1st, 1879	896
Amount received from sales as above reported and paid to State Treasurer	\$17 50

BALLOT PAPER.

The following is a statement of the transactions in ballot paper since the date of my last biennial report, which was up to July 1st, 1877:

	Reams.	Sheets.	Reams.	Sheets.
Number of reams on hand July 1st, 1877*			1,681	447
Number of reams distributed since	539			
Number of reams sold	922	415	1,461	415
Number of reams on hand July 1st, 1879			220	32
Amount received from sales of ballot paper and paid to State Treasurer				\$4,874 71

*In transcribing my last biennial report for the printer an error was made as to the quantity of ballot paper sold. It should read "123" instead of "103," as printed.

At the last session of the Legislature a law was passed authorizing the Secretary of State to sell the ballot paper then on hand at the current rates, and to sell all paper thereafter purchased by him at the cost price thereof. Upon the passage of said law I reduced the price of ballot paper from \$5 50 per ream, the price I was then selling it for, to \$3 50 per ream, that being the current rates at the time, and have ever since been selling it at the latter price.

At the same session of the Legislature an appropriation of \$10,000 was made for the purchase of ballot paper when needed, but as yet no portion of said appropriation has been expended.

STATUTES OF EIGHTEEN HUNDRED AND SEVENTY-SEVEN AND EIGHT AND AMENDMENTS TO THE CODES.

Copies of all the laws passed at the last session of the Legislature, with marginal notes, were delivered to the Superintendent of State Printing as soon after the adjournment of the Legislature as possible, and, on the receipt of the bound volumes from the State Printer, were by me disposed of as provided for in Section 409, Political Code. The following is a statement thereof:

Number of Statutes received from State Printer	2,250
Number of Statutes distributed	1,718
Number of Statutes sold	27
	<u>1,745</u>
Number of statutes on hand July 1st, 1879	505

Number of Amendments to the Codes received from State Printer.....	2,250
Number of Amendments to the Codes distributed	1,704
Number of Amendments to the Codes sold	38
	<hr/> 1,742
Number of Amendments to the Codes on hand July 1st, 1879	508
Amount received from sales, as above, and paid to State Treasurer	\$92 00

At the last session of the Legislature an appropriation of \$450 was made to the Secretary of State for indexing the laws of that session, but as the work was done in the office of the Superintendent of State Printing, this appropriation was not used by me.

The enrolled laws of the twenty-second session have been properly bound, and are on file in the office.

The Journals of the Senate and Assembly, together with the appendices, complete in four volumes (twenty-second session), have been received from the State Superintendent of Printing, and those remaining on hand, after the distribution required by law, turned over to the State Library.

The official acts of the Governor have been duly attested and properly registered in books kept in my office for that purpose, and all documents and other papers required by law to be filed and recorded in this office have been duly recorded in suitable books prepared for that purpose, and the originals filed away in a convenient form for reference.

REPORTS OF STATE GEOLOGICAL SURVEY.

The transactions in "Reports of the State Geological Survey," since the date of my last report, July 1st, 1877, are as follows:

Number of volumes on hand July 1st, 1877.....	169
Distributed upon orders from your Excellency:	
To Library of Washington Territory, one set	5
To Masonic Library, Salt Lake City, one set	5
To B'nai Brith Society, San Francisco, one set	5
To Golden Gate Academy, Oakland, one set	5
To San Francisco Free Library, one set	5
To President of the United States, one set	5
Sold for cash	19
	<hr/> 49
Number of volumes on hand July 1st, 1879	120
Amount received from sales, as above, and paid to State Treasurer.....	\$95 00

LAWS OF EIGHTEEN HUNDRED AND SEVENTY-SEVEN AND EIGHT, IN SPANISH.

In accordance with the provisions of the law, a joint committee of both Houses of the Legislature awarded the contract for translating, preparing the index, and correcting the proof-sheets for the printer, of the laws passed at that session, to Mrs. A. B. Godóy, at the rate of sixteen cents per folio. On the completion of the work a bill was presented to me by Mrs. Godóy, for approval, amounting to \$1,738 88, but, upon a careful examination of the work performed, I estimated that, at sixteen cents per folio, it would amount to \$1,491 20, which latter amount I certified to the Board of Examiners as correct.

The appropriation for the work was	\$1,500 00
The amount allowed	1,491 20
Balance unexpended	\$8 80

The bound volumes of the laws in Spanish were received by me from the State Superintendent of Printing, and have been distributed according to law, and the copies left on hand turned over to the State Library.

CONTINGENT FUND.

Appropriation for the 29th fiscal year	\$100 00
Appropriation for the 30th fiscal year	100 00
Total	\$200 00

This amount has been expended in the purchase of ice, towels, soap, etc., and subscriptions to newspapers for the use of this office.

SUPREME COURT REPORTS.

The following is a statement of the receipts and disposition of the California Reports from the date of my last report, July 1st, 1877, to June 30th, 1879:

Number of volumes on hand July 1st, 1877	5,541
Number of Volume 52 received from A. L. Bancroft & Co.	300
	5,841
Number of volumes distributed according to law	316
Number of volumes sold	5
	321
Number of volumes on hand July 1st, 1879	5,520
Amount received from sales, as above, and paid to State Treasurer	\$15 00

POSTAGE, EXPRESSAGE, TELEGRAPH, AND HAULING ACCOUNTS

For the 29th and 30th fiscal years, commencing July 1st, 1877, and ending June 30th, 1879:

On distribution of Statutes and Amendments to Codes, 1877-8	\$639 20
On distribution of Senate and Assembly Journals, 22d Session	117 00
On distribution of Appendices, 22d Session	80 23
On distribution of Statutes and Amendments, 1875-6	10 00
On distribution of Senate and Assembly Journals, 21st Session	4 75
On distribution of Appendices, 21st Session	17 20
On distribution of Hittell's Codes	2 64
On distribution of 51st California Reports	12 00
On distribution of Reports of Geological Survey	12 40
On distribution of sundry volumes California Reports	2 06
On distribution of Appendices, 20th Session	1 26
On distribution of Statutes and Amendments to Codes, 1877-8, in Spanish	18 52
On distribution of 52d California Reports	63 52
On distribution of miscellaneous books, documents, etc., by express	162 38
On books, packages, documents, etc., received by express	130 75
For office postage, stamps, post-office box rent, etc., etc.	887 30
To Western Union Telegraph Company	261 58
For hauling books, etc.	37 50
	\$2,460 29

Appropriation for 29th fiscal year.....	\$1,400 00	
Appropriation for 30th fiscal year.....	1,400 00	
	<u>\$2,800 00</u>	
Balance of appropriation for 29th fiscal year, unexpended.....		\$313 09
Balance of appropriation for 30th fiscal year, unexpended.....		133 97
		<u>\$447 06</u>

Less certain items in above statement, not paid July 1st, 1879, and which, when paid, are to be deducted from the appropriation for the 30th fiscal year, amounting to \$107 35, which would leave the balance unexpended for that year \$26 62. The telegraph bills and the bills for stamps are much larger than for the 27th and 28th fiscal years: this is owing, in a great measure, to the fact that the "Constitutional Convention" was in session for over five months of the 30th fiscal year, and during the whole of the time we were in the constant receipt of telegrams, letters, etc., from all parts of the State, and even from other States, asking for information, copies of various books, printed documents, etc., etc.; but even with this extra expense this branch of the expenses of the department in the aggregate is \$216 97 less than for the preceding nineteen months of my term, and \$2,937 18 less than for the corresponding two years of my predecessor's term, for, upon examination of his report for the 25th and 26th fiscal years, ending June 30th, 1875, I find the expenses for postage, expressage, etc., to be \$5,397 47. This makes the total expenses for the three years and seven months of my predecessor's term \$10,009 69, and for the corresponding three years and seven months of my term \$5,137 55, being a reduction in my favor of \$4,872 14.

STATIONERY, LIGHTS, FUEL, ETC., FUND.

The following sums have been allowed out of this fund:

For gas.....	\$6,681 35
For wood and kindling.....	5,423 25
For coal.....	1,756 38
For water in building.....	300 00
For stationery, etc.,.....	15,870 22
Total.....	<u>\$30,011 20</u>

APPROPRIATIONS.

Amount unexpended of the appropriation for the 28th fiscal year ---	\$4,426 38	
Appropriation for the 29th fiscal year.....	12,500 00	
		\$16,926 38
Deficiency June 30th, 1878.....		1,597 78
Total.....		<u>\$18,524 16</u>
Appropriation for the 30th fiscal year.....	\$12,500 00	
Amount expended to June 30th, 1879.....	11,487 04	11,487 04
Total.....		<u>\$30,011 20</u>
Balance unexpended June 30th, 1879.....	\$1,012 96	

It will be seen by the foregoing statement that the total expenditures during the 29th and 30th fiscal years amount to the sum of \$30,011 20, as follows: \$14,140 98 for gas, wood, coal, water, and kindling; and \$15,870 22 for what is called stationery, \$2,095 67 of which was for oils, varnish, lead, alcohol, turpentine, sponge, chamois skins, soap, matches, brooms, feather dusters, chair cushions, gas

burners, chimney shades, water basins, saw blades, mowers, mower knives, hatchets, hammers, fire shovels, hods, keys, corkscrews, hones, match boxes, twine, twine boxes, sash cord, coal scuttles, gas lighters, wax tapers, foot mats, mops, dust pans, brushes, tumblers, soap dishes, water pitchers, Japan trays, spittoons, glass tubes, stencil plates, repairing locks, cleaning and repairing clocks, cleaning carpets, and guns, making dating stamps and coin bags for Treasurer's office, and \$13,774 55 for other articles of stationery, including legal cap, fools-cap, brief, letter, note, cigarette, wrapping, blotting, and star paper, envelops, steel, quill, and ruling pens, red, black, violet, blue, and copying inks, black-lead, red and blue, artists' and indelible pencils, Moore's blotters, rubber erasers, gum royal, mucilage, mucilage stands and brushes, inkstands, pen-holders, rulers, paper cutters, paper fasteners, lithograph letter heads and envelops, calendars, desk pads, arm rests, board clips, pen-racks, paper weights, rubber bands, glass cups and sponges, eyelet punches and eyelets, newspaper files, Shipman's adhesive files, magic binders, blank books, scrap books, memorandum books, index books, diaries, letter copying books, letter copying presses and stands, auctioneer's blotters, McGill's press, drawing pins, waste paper baskets, shears, scissors, steel knife erasers, red tape, paste board and document envelops, gold seals, gold paper, etc.

It appears by the accounts kept in my office that the amounts charged for stationery, etc., delivered, upon requisitions duly signed, to the State officers, members of the Legislature, and others, to whom I am by law required to furnish stationery, etc., during the 29th and 30th fiscal years, are as follows:

To the State officers, including Governor, Lieutenant-Governor, Secretary of State, Controller, Treasurer, Attorney-General, Surveyor-General, Clerk of the Supreme Court, Adjutant-General, Superintendent of Public Instruction, Superintendent of State Printing, State Library, Supreme Court, Supreme Court Reporter, Clerk of the Supreme Court, State Board of Health, Commissioner of Transportation, State Engineer, Janitor of the building, Engine-room, and Capitol Park			\$6,412 87
Members of the Senate, 1877-8	\$1,316 42		
Officers and Committees, 1877-8	2,236 29		
		3,552 71	
Members of the Assembly, 1877-8	\$2,140 71		
Officers and Committees, 1877-8	2,161 51		
		4,302 22	
Reporters both Houses, 1877-8		394 50	
Constitutional Convention, 1878-9		166 53	
Total			\$14,828 83
By reference to the biennial report of my predecessor for the corresponding two years of his term, ending June 30th, 1875, I find that the expenditures from this fund amount to the sum of			
Amount expended during my term of two years			\$41,641 02
			30,011 20
Making a decrease in favor of my term of			\$11,629 82

STATE SEALER OF WEIGHTS AND MEASURES.

The Secretary of State is ex officio State Sealer of Weights and Measures, and his duties are set forth in Part III, Title I, Chapter III, Article XIV, Sections 561, 564, and 565 of the Political Code, but as the law now stands it is entirely inoperative, and little or no attention is paid to its provisions by the County Clerks and County

Boards of Supervisors, consequently I have nothing to report under this head.

STATE CAPITOL.

The Secretary of State is the Superintendent of the State Capitol, and it is made his duty to take charge of the building and keep the same, together with the property therein, in good order and repair. In the discharge of this duty I have looked solely to the best interests of the State, and incurred only such expense as was absolutely necessary for the preservation of the building and property therein.

The furniture, carpets, etc., are kept in good order by the Janitor and his assistants, who have rendered me valuable aid in the discharge of my duties as Superintendent, and, with the exception of the drapery in the Senate and Assembly Chambers and Supreme Court-room, are almost as good as when I first took charge of the building.

The engine-room, under charge of Mark Foster, the engineer, is a model of neatness, and the affairs of this department are being conducted as economically as efficiency and the safety of the building and works will permit, all of the repairs about the engine, boilers, pipes, etc., etc., being done by the efficient engineer himself, aided by his assistant, at no expense to the State except for the cost of the raw material, making a saving of over fifteen hundred dollars in this department alone. In addition to this the engineer has, with the assistance of the keeper of the gas-room, done a large amount of repairing in and about the building which, if done in the usual way, would have cost the State over five hundred dollars.

In conclusion, I hereto append a statement of the receipts and expenditures of this department during the forty-three months of my term, ending June 30th, 1879, and those of my predecessor for the corresponding forty-three months of his term, ending June 30th, 1875, showing the difference in the expenses and receipts of the two terms:

	Forty-three Months Preceding Term, Dec. 1st, 1871, to July 1st, 1875.	Forty-three Months Present Term, Dec. 6th, 1875, to July 1st, 1879.	Decrease of Ex- penses during Present Term, to July 1st, 1879.
For wood, coal, gas, and water.....	\$34,039 19	\$26,873 29	\$7,165 90
For stationery to State officers and others.....	16,769 23	10,895 57	5,873 66
For stationery to Senate, officers, and committees.....	10,979 03	6,349 52	4,629 51
For stationery to Assembly, officers, and committees.....	15,202 00	7,686 40	7,515 60
For stationery to sundries.....	746 67	337 76	408 91
For postage, expressage, and hauling.....	10,009 69	5,127 55	4,872 14
For indexing Journal, Senate and As- sembly.....	450 00	-----	450 00
For translating laws into Spanish.....	4,810 02	2,866 56	1,943 46
	\$93,005 83	\$60,146 65	\$32,859 18
Amount of fees received.....	\$27,774 15	\$43,106 15	-----
Increase of receipts of the present term.....	-----	-----	15,332 00
Making a total in favor of the present term of.....	-----	-----	\$48,191 18

STATE OF CALIFORNIA, }
 County of Sacramento, } ss.

Thomas Beck, Secretary of State of the State of California, being duly sworn, on his oath says, that the foregoing report contains a detailed account of all his official actions as Secretary of State (except of such as relate to his ex officio duties) from the date of his last report, July 1st, 1877, up to the 1st day of July, 1879, and particularly a detailed statement of the manner in which all appropriations for his office, for the 29th and 30th fiscal years, have been expended, to the best of his knowledge and belief.

THOMAS BECK.

Subscribed and sworn to before me, this 20th day of August,
 A. D. 1879.

[SEAL.]

D. B. WOOLF, Clerk.

By JOHN P. POOLE, Deputy Clerk.

BIENNIAL REPORT

OF THE

Controller of the State of California,

FOR THE

29th and 30th Fiscal Years, Commencing July 1st, 1877, and Ending June 30th, 1879.

TRANSMITTED TO THE GOVERNOR SEPTEMBER 10, 1879.

REPORT.

OFFICE OF CONTROLLER, }
SACRAMENTO, September 10th, 1879. }

To His Excellency, William Irwin, Governor of California:

SIR: In accordance with Section 433 of the Political Code, I have the honor to transmit herewith my official report of the financial operations of this department for the 29th and 30th fiscal years, commencing on the 1st day of July, 1877, and ending on the 30th day of June, 1879 (both days inclusive), together with such estimates of expenditures as I am by law required to make. Tables containing detailed statements of the various transactions will be found in the Appendix, arranged as follows:

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1 AND 2.

Receipts for the 29th and 30th fiscal years.

3 AND 4.

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6.

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Estimate of expenditures for the 32d and 33d fiscal years, ending June 30th, 1882.

RECEIPTS AND EXPENDITURES.

From the tabular statements in the Appendix, it will be seen that the receipts into, and expenditures from, the State treasury were as follows:

RECEIPTS.

Twenty-ninth fiscal year, 1877-8	\$3,913,494 45	
Thirtieth fiscal year, 1878-9	3,543,610 77	
Total		\$7,457,105 22

EXPENDITURES.

Twenty-ninth fiscal year, 1877-8	\$3,795,480 53	
Thirtieth fiscal year, 1878-9	3,544,361 63	
Total		\$7,339,842 16
Excess of receipts over expenditures		\$117,263 06

The principal sources of receipts were:

SOURCE.	29th Fiscal Year.	30th Fiscal Year.
Property tax	\$3,318,387 49	\$3,006,474 45
School lands—"Principal and Interest"	129,061 20	120,852 66
Harbor Commissioners—from rent of wharves and docks in San Francisco	284,345 06	281,531 43
Fees paid by State officers	39,442 17	38,687 54
Reclamation tax—Levee District No. 5, Sutter County	6,300 00	16,787 44
All other sources	135,958 53	79,277 25
Total receipts	\$3,913,494 45	\$3,543,610 77

For a more detailed account of receipts and expenditures, see Statements Nos. 1, 2, 3, and 4, in the Appendix accompanying this report, where they will be found arranged under their proper headings and appropriations.

GENERAL FUND.

The General Fund receipts were:

SOURCE.	29th Fiscal Year.	30th Fiscal Year.
Balance on hand July 1st, 1877 -----	\$330,388 74	-----
Receipts from property tax, etc. -----	1,793,665 53	\$1,437,607 35
Transfers to close other funds—Act March 9th, 1878 -----	24,744 61	-----
Warrants canceled -----	38 50	107 00
Total receipts -----	\$2,148,837 38	\$1,437,714 35

The General Fund expenditures were:

PURPOSE.	29th Fiscal Year.	30th Fiscal Year.
Warrants issued -----	\$1,740,635 12	\$1,461,246 87
Total expenditures -----	\$1,740,635 12	\$1,461,246 87

Receipts for 29th and 30th fiscal years, including balance July 1st, 1877 ----- \$3,586,551 73
 Expenditures for 29th and 30th fiscal years ----- 3,201,881 99

Excess of receipts being—(balance in General Fund, July 1st, 1879)----- \$384,669 74

At the commencement of the 29th fiscal year, July 1st, 1877, there was in the General Fund the sum of \$330,388 74; at the end of the 30th fiscal year, June 30th, 1879, there was an unexpended balance of \$384,669 74.

SCHOOL FUND.

The amount reported by this office to the Superintendent of Public Instruction, subject to apportionment for the support of Common Schools, from February 21st, 1877, up to and including February 18th, 1879, was \$3,005,926 45, which amount was received from the following sources:

SOURCE.	29th Year.	30th Year.
Balance of apportionment of February 21st, 1877, not distributed -----	\$484 33	-----
Balance of apportionment of February 16th, 1878, not distributed -----	-----	\$775 54
Interest on bonds held in trust by the State Treasurer -----	124,387 91	113,766 30
Interest on school lands -----	62,398 36	48,460 94
Property tax -----	1,392,476 31	1,262,647 51
Sale of Geological Reports -----	224 00	305 25
Total -----	\$1,579,970 91	\$1,425,955 54

The amount apportioned to each scholar for the year ending February 16th, 1878, was \$7 89½, and for the year ending February 18th, 1879, it was \$6 93. The whole amount distributed during those two years was, for the 29th year, \$1,579,195 37, and for the 30th year,

\$1,423,941 75, leaving a balance in the School Fund on February 18th, 1879, unapportioned, of \$2,013 79.

Since the last biennial report the Board of Examiners have purchased, for the benefit of the School Fund, with money arising from the sales of State school lands, county bonds to the extent and value of \$100,400, and drawing interest, as follows:

NAME OF COUNTY.	Amount.	Rate of Interest.
Sacramento	\$10,400 00	6 per cent.
Napa	60,000 00	7 per cent.
Solano	10,000 00	7 per cent.
San Luis Obispo	10,000 00	8 per cent.
Stanislaus	10,000 00	8 per cent.
Total	\$100,400 00	

Leaving a balance in the State School Land Fund of \$38,552 81 subject to investment.

On the 30th day of June, 1879, the State Treasurer held in trust, for the benefit of the School Fund, the following bonds:

SERIES.	Amount.	Rate of Interest.
State Capitol bonds of 1870	\$236,000 00	7 per cent.
State Capitol bonds of 1872	115,000 00	7 per cent.
State bonds of 1873	1,386,500 00	6 per cent.
County bonds	274,300 00	6 to 10 per cent.
Total	\$2,011,800 00	

These bonds produce an annual interest of \$129,662 00.

UNIVERSITY FUND.

The amount and denomination of bonds now held in trust by the State Treasurer for the University Fund, under Act of March 19th, 1878, "creating the Consolidated Perpetual Endowment Fund of the University of California," is as follows:

SERIES.	Amount.	Rate of Interest.
State Capitol Bonds of 1872	\$135,000 00	7 per cent.
State Bonds of 1873 (funded debt)	817,500 00	6 per cent.
Santa Clara County Bonds of 1877	11,000 00	7 per cent.
San Francisco City and County Bonds of 1858 (funded debt)	46,000 00	6 per cent.
San Francisco City and County Bonds of October 1st, 1863	20,000 00	7 per cent.
San Francisco City and County Park and Avenue Improvement Bonds of 1873	50,000 00	6 per cent.
San Francisco City and County Montgomery Avenue Bonds of 1873	22,000 00	6 per cent.
San Francisco City and County Park Improvement Bonds of 1874	1,000 00	6 per cent.
San Francisco City and County School Bonds of July 1st, 1874	30,000 00	6 per cent.
San Francisco City and County City Hall Construction Bonds of July 1st, 1874	38,500 00	6 per cent.
Amount carried forward	\$1,171,000 00	

UNIVERSITY FUND—Continued.

SERIES.	Amount.	Rate of Interest.
Amount brought forward	\$1,171,000 00	
San Francisco City and County Dupont Street Bonds of January 1st, 1877	40,000 00	7 per cent.
City of Oakland (Alameda County) Sewer Bonds of November 5th, 1875	13,000 00	8 per cent.
Town of Alameda (Alameda County) School Bonds of March 28th, 1878	10,000 00	6 per cent.
Santa Clara County Western Pacific Railroad Subscription Bonds	10,000 00	7 per cent.
Total	\$1,244,000 00	

These bonds yield an annual interest of \$77,060, which is paid to the Regents for the support of the University; the principal remaining in the Consolidated Perpetual Endowment Fund.

The amount drawn from the State treasury through appropriations made by the Legislature in aid of the State University was, during the 29th and 30th fiscal years, \$53,617 65, which amount includes the interest paid in support of the Hastings College of the Law.

STATE DEBT.

The total funded debt of the State on June 30th, 1879, was:

SERIES.	Amount.	Rate of Interest.
State Bonds of 1873 (funded debt)	\$2,801,000 00	6 per cent.
State Capitol Bonds of 1870	250,000 00	7 per cent.
State Capitol Bonds of 1872	250,000 00	7 per cent.
Soldiers' Relief Bonds	95,500 00	7 per cent.
State Bonds of 1857	5,000 00	7 per cent.
State Bonds of 1860	1,500 00	7 per cent.
Total	\$3,403,000 00	

As all the bonds of the issues of 1857 and 1860 have been called in, and the interest ceased on the 31st day of July, 1875, the funded debt bearing interest at this date will therefore only amount to \$3,396,500. The annual interest on this sum amounts to \$209,745; but as the State has guaranteed interest to the amount of \$105,000 per annum on Pacific Railroad Bonds (see Act of April 4th, 1864, Statutes 1863-4, p. 344, entitled "an Act to aid the construction of the Central Pacific Railroad," etc.), the annual amount of interest to be raised will therefore be \$314,745.

The following table shows the disposition of the funded debt of the State on June 30th, 1879:

KIND OF DEBT.	Amount.
Bonds held in private hands.....	\$713,000 00
Bonds held in trust by State Treasurer for School Fund.....	1,737,500 00
Bonds held in trust by State Treasurer for University Fund.....	952,500 00
Total.....	\$3,403,000 00

Deduct from this \$96,386 47, the amount in the Interest and Sinking Fund applicable to redemption of bonds, and we find the net bonded indebtedness of the State to be \$3,306,613 53. In calculating the amount that is now in the Interest and Sinking Fund applicable to the redemption of bonds, I have deducted the amount that will be necessary to pay the interest due on bonds on January 1st, 1880; this deduction is rendered necessary, as that interest will be due before any considerable amount can be received for that purpose from taxes.

The total amount of money in the Interest and Sinking Fund on June 30th, 1879, was \$253,758 97; the amount necessary to pay accruing interest on bonds, due January 1st, 1880, is \$157,372 50; deducting this amount from that in the fund, and we find \$96,386 47 as the balance applicable to the redemption of bonds.

The interest-bearing debt of the State on June 30th, 1879, was held as follows:

KIND OF DEBT.	Amount.
Bonds held in private hands.....	\$706,500 00
Bonds held in trust by State Treasurer for School Fund.....	1,737,500 00
Bonds held in trust by State Treasurer for University Fund.....	952,500 00
Total.....	\$3,396,500 00

The bonds held in private hands and bearing interest at this date consist of:

State Capitol Bonds of 1870—7 per cent.....	\$14,000 00
Soldiers' Relief Bonds—7 per cent.....	95,500 00
State Bonds of 1873 (funded debt)—6 per cent.....	597,000 00
Total.....	\$706,500 00

The interest on these bonds amounts to \$43,485 per annum.

STATE LOAN TO CALAVERAS COUNTY.

Under authority of an Act of the Legislature, dated March 30th, 1872, the sum of \$60,212 50 was loaned by the State to Calaveras County, for the purpose of redeeming county bonds. The Board of Supervisors are required, by the provisions of the Act, to levy an annual tax of not less than ten nor more than twenty-five cents on each one hundred dollar's valuation of property, for the purpose of repaying the State. Up to the close of the present fiscal year (June 30th, 1879), the sum of \$9,433 45 had been collected and paid over to the State. Of this amount the sum of \$1,782 48 was paid during the

29th fiscal year, and the sum of \$1,798 79 during the 30th fiscal year, (leaving an unpaid balance of \$50,779 05 on June 30th, 1879).

SWAMP LAND DISTRICT FUNDS.

The total amount of Controller's warrants outstanding against the several Swamp Land District Funds, June 30th, 1879, was \$61,347 69, apportioned as follows:

NUMBER AND LOCATION OF DISTRICT.	Amount.
District No. 1, Sacramento and Sutter Counties-----	\$14,228 25
District No. 2, Sacramento County-----	11,324 68
District No. 5, San Joaquin County-----	3,870 31
District No. 6, Tulare County-----	120 00
District No. 7, Solano County-----	117 00
District No. 16, Tulare County-----	36 00
District No. 17, San Joaquin County-----	8 00
District No. 18, Yolo and Solano Counties-----	30,146 60
District No. 41, Solano County-----	657 50
District No. 45, Tulare County-----	472 06
District No. 48, Tulare County-----	4 20
District No. 59, San Joaquin County-----	363 09
Total-----	\$61,347 69

In the case of Juliet Charlton vs. J. G. Estudillo, State Treasurer, the Supreme Court, at its July term, 1877, decided that the petitioner, who held a warrant drawn on the Fund of Swamp Land District Number One, was entitled to interest thereon at the rate of ten per cent. per annum from the date thereof. Since this decision the State Treasurer has held that it applies to all warrants outstanding against the funds mentioned in the Act on which the decision appears to be based, and has paid all warrants redeemed from the Swamp Land District Funds Nos. 1, 2, 5, and 18, with interest at the rate of ten per cent. per annum from date of issue. As the warrants drawn on those funds have now been outstanding on an average about twelve years, it may be considered that the indebtedness of these districts is more than double the amount represented in the above table, or about \$131,053 65, which, added to \$1,777 85, the outstanding indebtedness of the remaining districts, would show a total outstanding indebtedness of the several District Swamp Land Funds, June 30th, 1879, of both principal and interest, of about \$132,831 50. The following table shows the amount of money in the State treasury, June 30th, 1879, applicable to the payment of the above indebtedness:

NAME OF FUND.	Amount.
Swamp Land District No. 1 Fund-----	\$443 03
Swamp Land District No. 2 Fund-----	883 30
Swamp Land District No. 5 Fund-----	173 32
Swamp Land District No. 17 Fund-----	8 00
Swamp Land District No. 18 Fund-----	534 72
Swamp Land District No. 41 Fund-----	44
Swamp Land District No. 45 Fund-----	9 85
Swamp Land District No. 59 Fund-----	390 38
Total-----	\$2,443 04

DELINQUENT PROPERTY TAX OF EIGHTEEN HUNDRED AND SEVENTY-SEVEN AND EIGHT AND EIGHTEEN HUNDRED AND SEVENTY-EIGHT AND NINE, DUE THE STATE JUNE THIRTIETH, EIGHTEEN HUNDRED AND SEVENTY-NINE.

There was due the State from the several counties, June 30th, 1879, on account of property tax for assessments of 1877-8 and 1878-9, the following sums:

YEAR.	Amount.
Assessment for 1877-8, 29th fiscal year.-----	\$187,961 87
Assessment for 1878-9, 30th fiscal year.-----	141,342 28
Total delinquency-----	\$329,304 15

The delinquency for the 29th fiscal year is a little less than five and nine one-hundredths (5.09) per cent. of the amount levied for State purposes, whilst that of the 30th fiscal year is a little less than four and four-tenths (4.4) per cent. of its levy, which rates show a marked decrease from the percentage of delinquency in former years.

In making up the amount of delinquent property tax due the State, I find that the amount of delinquency in the City and County of San Francisco is out of proportion to the whole amount delinquent in the other counties of the State. By reference to Statement No. 9 (Appendix), we find that of the "amount levied" for State purposes (\$3,697,803 75) during the year 1877-8, the amount belonging to the City and County of San Francisco is \$1,605,654 60, a little less than (43.5) forty-three and five-tenths per cent. of the whole State levy, whilst of the "amount delinquent" June 30th, 1879 (\$187,961 87), of said levy, the amount belonging to the City and County of San Francisco is (Statement No. 13) \$153,164 71, a little less than (81.5) eighty-one and five-tenths per cent. of the delinquency. Statement No. 10 shows that of the "amount levied" for State purposes (\$3,215,179 19) during the year 1878-9, the amount belonging to the City and County of San Francisco is \$1,345,447 18, a little less than forty-one and nine-tenths (41.9) per cent. of the whole State levy, whilst of the "amount delinquent" June 30th, 1879 (\$141,342 28), of said levy, the amount belonging to the City and County of San Francisco is (Statement No. 14) \$108,649 73, a little less than seventy-six and nine-tenths (76.9) per cent. of the delinquency. This shows that the percentage of the amount delinquent in the City and County of San Francisco (for the State) to the whole State delinquency is greatly out of proportion to her percentage of the whole State levy.

A more material reduction in the "total delinquency" could have been effected if the State's collection on the assessed value of personal property in the City and County of San Francisco was made at the same time as the collection for the city and county itself, in the same manner as is done in other counties of the State. The City and County of San Francisco levies her tax in July, while the State does not levy until September following, and the city and county having by that time collected the greater part of her assessment on personal property, unsecured by real estate, pays very little attention to the

collection of the State levy on this class of property. She is enabled to collect on this class of property in this way, and to ignore the State levy, because she is excepted from the operation of Section 3820 of the Political Code, which makes it the duty of the Assessor, in the other counties, when he is assessing, to act as Collector, and to collect the State as well as the county taxes on personal property, when in his opinion they are not sufficiently secured by real estate. Section 3823 fixes the rate to be used as that of the previous year.

Now, if the same method of collecting State taxes on personal property, as is provided by Sections 3820 and 3823 for other counties, had prevailed in the City and County of San Francisco, the delinquency on the assessment of 1877-8 and 1878-9 in the State ought not to have been more than three (3) per cent. on either year, which would have been a great reduction from the present percentage.

COST OF ASSESSING AND COLLECTING STATE TAX.

The commissions and mileage allowed for assessing, auditing, collecting, keeping, and paying in State taxes for the 29th and 30th fiscal years, were as follows:

OFFICERS.	29th Fiscal Year.	30th Fiscal Year.
Assessors -----	\$71,144 58	\$64,254 07
Auditors -----	30,428 50	27,639 57
Tax Collectors -----	37,529 85	31,714 87
Assessors, as Tax Collectors -----	723 56	2,137 02
Treasurers -----	52,102 52	45,973 83
Totals -----	\$191,929 01	\$171,719 36

The commissions paid for assessing, auditing, collecting, keeping, and paying in State taxes during the 29th fiscal year were a little less than five and forty-seven one-hundredths (5.47) per cent. of the gross amount of property tax collected for that year; and during the 30th fiscal year, they were a little less than five and six-tenths (5.6) per cent. of the gross amount collected. This percentage for collecting, etc., added to the above-mentioned percentage for delinquency, shows that the entire percentage for delinquency and commissions on the State taxes for the 29th fiscal year was a little less than ten and fifty-six one hundredths (10.56) per cent., while for the 30th fiscal year it was a little less than ten (10) per cent.

COLLECTION OF REVENUE.

With regard to the collection of revenue for the State, I must reiterate the recommendations made in my last biennial report, as to the necessity and reason for abolishing compensation to county officers for auditing, assessing, collecting, keeping, and disbursing State taxes or other State moneys, save in the case of County Treasurers, who should be allowed their mileage for bringing the State money to the State treasury.

First—Because, under the present system, there are eight different rates of compensation allowed to Tax Collectors for their services in

collecting State taxes, giving some counties a much larger sum for the services of said Tax Collectors than is received by others.

Second—Because there are two counties that receive nothing for collecting State taxes.

Third—Because a large number of the county officers are salaried, and the money allowed them by the State for the aforesaid auditing, collecting, etc., of State taxes, goes back into the treasuries of those counties to which the officers belong, and there is neither reason nor sense in collecting about \$200,000 annually from the several counties, in the shape of State taxes, and then paying the same back to those counties and their officers as compensation for auditing, assessing, collecting, etc., for the State its portion of the taxes collected.

Fourth—Because the present system of allowing for auditing, collecting, assessing, and disbursing State taxes a certain percentage on the first \$10,000 collected, and a certain other percentage on the next \$10,000, and so on, and then excepting certain moneys, certain officers, and certain counties from the operation of the law, is very complicated, and leads to many errors in the county officers' books, increases the work in this office, and is of no practical benefit to anybody. Therefore, I would recommend that in those counties where the commissions allowed by the State to the Auditors, Assessors, Collectors, and Treasurers, are received by those officers as part payment of their respective salaries, that their respective counties pay them for all such services rendered the State (in reference to State taxes) the amount that they now receive from the State for the same, and that the laws allowing said commissions to either counties or county officers by the State be abolished. Thus the State would pay back nothing to the several counties or officers thereof for the aforesaid services, nor would she collect from the several counties so much by about \$200,000 annually, in the shape of an unnecessary tax, as she now does, and every county would be treated alike in the premises (which is not now the case). Settlements between the Tax Collectors and County Auditors would be much simplified, and it would be within the range of possibilities for the Controller to keep a correct property tax account with the several counties.

RATE OF TAXATION.

The rate of taxation for the 29th fiscal year (1877-8) was 63 cents; and for the 30th fiscal year (1878-9) was 55 cents on each \$100 valuation of taxable property, and was apportioned in the following manner:

FUNDS.	29th Fiscal Year.	30th Fiscal Year.
General Fund -----	32.	25.6
School Fund -----	25.	23.3
Interest and Sinking Fund -----	6.	6.1
	63.	55.

ESTIMATE OF EXPENDITURES.

Subdivision two of section 433, Political Code, requires that a detailed statement of the estimate of expenditures, necessary for the support of the government of the State, for the 32d and 33d fiscal years, shall accompany this report; that each object of expenditure shall be specified, distinguishing between such as are provided for by permanent or temporary appropriations, and such as must be provided for by new statute, and the means suggested by which such expenditures are to be defrayed.

Statement Number 23, of the Appendix, is referred to for the particular objects for which appropriations are needed. The temporary appropriations recommended are for the pay of porters, postage and expressage, contingent expenses, etc., in State offices, for support of State Printing Office, State Prison, Insane Asylums, Deaf, Dumb, and Blind Institute, State Normal School, and for nearly all the appropriations under the head of miscellaneous. The appropriations to be provided for and fixed by new statute are those necessary for the offices of Railroad Commissioners and State Board of Equalization.

The appropriation recommended for interest on bonds includes the sum of \$105,000 per annum, guaranteed by the State on Central Pacific Railroad Bonds. The amount for support of schools is based on Section 443, Political Code (and it will continue to increase as the annual school census shows an increase in the school children of the State). The balance of the estimate is based on the amounts fixed by statute.

The means necessary to defray these expenses will have to be derived from taxation of property. The total amount of the estimate, for the two fiscal years, is \$6,044,724; of which amount the sum of \$3,069,862 will be required for the 32d fiscal year, and \$2,974,862 for the 33d fiscal year.

SUGGESTIONS IN REFERENCE TO REDEMPTION OF STATE DEBT, ETC.

As hereinbefore stated, there is in the Interest and Sinking Fund the sum of \$96,386 47, which should be applied to the redemption of the funded indebtedness of the State, now held by private parties. Legislation will be necessary to enable the State Treasurer to so apply the said money. An Act of the Legislature, authorizing the State Treasurer to exhaust the aforesaid sum in the redemption of said bonds, will effect a reduction of between \$6,000 and \$7,000 per annum in the amount of interest now paid by the State.

GENERAL REMARKS.

The tax levy for the 30th fiscal year (*i. e.*, 1878-9) was, for the General Fund (from which is paid the current expenses of the State Government), \$1,320,000, or a rate of 25.6 cents on each \$100 valuation of property, which was the smallest tax levied for said current expenses since the year 1871; and yet, at the end of said 30th fiscal year (to wit, June 30th, 1879), there was in said General Fund a balance of over \$384,000. The amount levied for the General Fund for the (present) 31st fiscal year, commencing July 1st, 1879, is \$1,450,000 (the increase over last year's levy is rendered necessary by the requirements of the incoming Legislature), or a rate of 30 cents on

each \$100 valuation of property. This is the smallest levy for general purposes since the year 1871, save and except that of last year.

It will be perceived that the rate for said General Fund for the 31st fiscal year is 4.4 cents on each \$100 greater than it was for the preceding year; the most of this increase is due to the fact that the assessment roll, upon which the tax was levied, is less by nearly \$37,000,000 this year than it was last year.

There has been a greater amount of fees of office and commissions paid into the State treasury by the Harbor Commissioners, Surveyor-General, Secretary of State, and Clerk of the Supreme Court during the last three years and a half than was paid in during the same length of time by their predecessors, and the taxes have been more closely and cheaply collected than ever before. (Vide pages 58, 59, 60, and 61 of this report.) There has been a material reduction in the running expenses of the State Government during the past three and a half years, and the financial condition of the State is sound and healthy.

To my Deputy, Book-keeper, and Clerks I am much indebted for most valuable services, cheerfully rendered; they have been ambitious to excel in their several departments, and have honestly, faithfully, and ably served the State.

To all of the foregoing I have the honor to affix my signature.

W. B. C. BROWN, Controller.

STATEMENT

Showing in detail the manner in which the appropriations for postage and expressage in the office of Controller of State, for the 29th and 30th fiscal years, were expended, from July 1st, 1877, to June 30th, 1879, inclusive:

TWENTY-NINTH FISCAL YEAR.

July 3, 1877, W. C. Hopping, box rent.....	\$4 00
July 3, 1877, W. C. Hopping, postage stamps.....	25 00
July 20, 1877, Wells, Fargo & Company, expressage—an expense of 28th fiscal year.....	3 50
September 26, 1877, W. C. Hopping, box rent.....	4 00
September 26, 1877, W. C. Hopping, postage stamps.....	46 00
January 3, 1878, Wells, Fargo & Company, expressage.....	25
January 3, 1878, W. C. Hopping, box rent.....	8 00
January 3, 1878, W. C. Hopping, postage stamps.....	41 75
February 8, 1878, Western Union Telegraph Company, telegraphing.....	4 20
May 14, 1878, W. C. Hopping, postage stamps.....	20 00

THIRTIETH FISCAL YEAR.

July 6, 1878, W. C. Hopping, box rent and postage.....	4 09
July 6, 1878, Wells, Fargo & Company, expressage—an expense of 29th fiscal year.....	2 10
July 16, 1878, W. C. Hopping, postage stamps.....	30 00
October 5, 1878, W. C. Hopping, box rent.....	4 00
October 9, 1878, Wells, Fargo & Company, expressage.....	60
December 4, 1878, W. C. Hopping, postage stamps.....	20 00
December 5, 1878, Western Union Telegraph Company, telegrams.....	40
January 7, 1879, W. C. Hopping, box rent.....	4 00
February 13, 1879, Western Union Telegraph Company, telegrams.....	7 27

Amount carried forward..... \$267 72

Amount brought forward.....	\$267 72
March 4, 1879, Western Union Telegraph Company, telegrams.....	1 66
March 22, 1879, W. C. Hopping, postage stamps.....	20 00
April 2, 1879, W. C. Hopping, box rent and postage.....	4 10
April 3, 1879, Wells, Fargo & Company, expressage.....	12 80
	<hr/> \$267 72

STATE OF CALIFORNIA, }
County of Sacramento, } ss.

I, W. B. C. Brown, Controller of State, do solemnly swear that the above and foregoing contains a true and correct statement in detail of the manner in which the appropriations for postage and expressage in the office of Controller of State, for the 29th and 30th fiscal years, was expended, from July 1st, 1877, to June 30th, 1879, inclusive, as per vouchers now on file in this office.

W. B. C. BROWN.

Subscribed and sworn to before me, this 6th day of September, A. D. 1879.

[SEAL.]

D. B. WOOLF, Clerk.

By JOHN P. POOLE, Deputy Clerk.

STATEMENT

Showing in detail the manner in which the appropriations for contingent expenses in the office of Controller of State, for the 29th and 30th fiscal years, was expended, from July 1st, 1877, to June 30th, 1879, inclusive:

TWENTY-NINTH FISCAL YEAR.

July 3, 1877, Geo. I. Lytle, subscription to Examiner, for 28th fiscal year.....	\$3 30
July 20, 1877, Pacific Ice Company, ice, for 28th fiscal year.....	2 50
August 8, 1877, Pacific Ice Company, ice.....	3 90
August 22, 1877, Mrs. Fisher, washing towels.....	1 00
August 22, 1877, C. E. Spencer, subscription to Record-Union, for 28th fiscal year....	5 25
September 14, 1877, T. McMorry, soap.....	1 50
September 14, 1877, Pacific Ice Company, ice.....	2 70
October 3, 1877, Geo. I. Lytle, subscription to Examiner.....	3 30
October 16, 1877, Pacific Ice Company, ice.....	1 20
November 21, 1877, Pacific Ice Company, ice.....	2 70
January 11, 1878, Geo. I. Lytle, subscription to Examiner.....	3 30
January 11, 1878, W. A. Gett, washing towels.....	2 65
January 11, 1878, C. E. Spencer, subscription to Record-Union.....	6 50
February 8, 1878, W. Halley, directory.....	3 00
April 11, 1878, Geo. I. Lytle, subscription to Examiner.....	3 30
April 11, 1878, business directory.....	2 00
April 11, 1878, C. E. Spencer, subscription to Record-Union.....	3 25
April 18, 1878, T. McMorry, soap, oil stone, etc.....	5 50

THIRTIETH FISCAL YEAR.

July 3, 1878, C. E. Spencer, subscription to Record-Union, for 29th fiscal year.....	3 25
July 3, 1878, G. I. Lytle, subscription to Examiner, for 29th fiscal year.....	3 30
July 3, 1878, subscription to Mountain Democrat, for 29th fiscal year.....	5 00
July 3, 1878, subscription to Watsonville Transcript, for 29th fiscal year.....	3 00
July 31, 1878, Pacific Ice Company, ice, for 29th fiscal year.....	2 30
August 2, 1878, subscription to Home Newspaper, for 29th fiscal year.....	1 50
August 2, 1878, subscription to Golden Era, for 29th fiscal year.....	3 00
August 7, 1878, Pacific Ice Company, ice.....	2 60
September 4, 1878, Pacific Ice Company, ice.....	2 70
October 5, 1878, Pacific Ice Company, ice.....	2 50

Amount carried forward.....	\$84 00
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Amount brought forward.....	\$84 00
October 5, 1878, Geo. I. Lytle, subscription to Examiner.....	3 30
November 7, 1878, Pacific Ice Company, ice.....	2 70
December 17, 1878, C. E. Spencer, subscription to Record-Union.....	6 50
December 18, 1878, W. A. Gett, washing towels.....	5 00
January 7, 1879, Geo. I. Lytle, subscription to Examiner.....	3 30
February 17, 1879, subscription to Golden Era.....	2 00
April 2, 1879, Geo. I. Lytle, subscription to Examiner.....	3 30
April 2, 1879, T. McMorry, soap.....	1 75
June 20, 1879, Pacific Ice Company, ice.....	2 50
June 20, 1879, business directory.....	3 00
June 21, 1879, C. E. Spencer, subscription to Record-Union.....	6 00
	<hr/> \$125 35

STATE OF CALIFORNIA, }
County of Sacramento, } ss.

I, W. B. C. Brown, Controller of State, do solemnly swear that the above and foregoing contains a true and correct statement in detail of the manner in which the appropriations for contingent expenses in the office of the Controller of State, for the 29th and 30th fiscal years, was expended, from July 1st, 1877, to June 30th, 1879, inclusive, as per vouchers now on file in this office.

W. B. C. BROWN.

Subscribed and sworn to before me, this 6th day of September, A. D. 1879.

[SEAL.]

D. B. WOOLF, Clerk.

By JOHN P. POOLE, Deputy Clerk.

INDIAN WAR BONDS—CONTROLLER'S REPORT.

CONTROLLER'S OFFICE, }
SACRAMENTO, May 27th, 1878. }

To His Excellency, William Irwin, Governor of California :

SIR: In conformity with your request, made under the authority of Assembly Joint Resolution No. 73, adopted March 30th, 1878, which reads as follows—

*Resolved by the Assembly of the State of California, the Senate concurring—*First, that our Senators be instructed, and our Representatives requested, to urge upon Congress the immediate payment of all bonds, coupons, and certificates of coupons issued by the State of California, for expenses incurred in the Indian wars, which have not been paid by the General Government; second, that his Excellency, the Governor, be requested to cause a statement of all such bonds, certificates, and coupons, and the circumstances connected therewith, to be prepared by the Controller, and, upon such statement being prepared, to cause an application to be made to Congress, in the name of the State of California, for the payment of said bonds, coupons, and certificates; third, and that he forward a copy of these resolutions to each of our Senators and Representatives in Congress.

—I have the honor to make the following statement:

I find, upon examination of War Bond Register in State Treasurer's office, and other records in Controller's office, that, under the Act of the Legislature of California, approved February 15th, 1851, (Statutes 1851, page 520,) Indian war bonds were issued by the State of California to the amount of \$200,000, bearing interest at the rate of twelve per cent. per annum, and payable in ten years; that, under the Act of the Legislature of May 3d, 1852, (Statutes of 1852, page 59,) Indian war bonds were issued by the State of California to the amount of \$638,100, bearing interest at the rate of seven per cent. per annum, and payable in ten years.

Of the principal of the above named bonds of 1851, amounting to \$200,000, I find, according to printed report of William Theodore Van Doren, Clerk Third Auditor's Office, Washington, made January 10th, 1872, (see Appendix to Journal of California Senate and Assembly, for the 19th Session, pages 28 and 29,) that the United States Government has paid \$197,000; that of the principal of the above named bonds of 1852, amounting to \$638,100, (according to said report of William Theodore Van Doren, above referred to,) the United States Government has paid \$598,450; that of the principal of the last above named bonds the State of California (according to Controller's books) has paid \$22,850, leaving outstanding of the principal of the bonds of 1851, \$3,000; of the principal of the bonds of 1852, \$16,800; making a total amount of said bonds outstanding of \$19,800, together with interest on the same, which said principal and interest, together with the number and denomination of each of said outstanding bonds, is given in the following table, to wit:

OUTSTANDING SEVEN PER CENT. WAR BONDS, 1852.

No.	DATE OF BOND.	Amount.	Interest to May 2, 1862.	Total.
132	October 11, 1852	\$100 00	\$66 91	\$166 91
133	October 11, 1852	100 00	66 91	166 91
134	October 12, 1852	100 00	66 89	166 89
135	October 12, 1852	100 00	66 89	166 89
136	October 12, 1852	100 00	66 89	166 89
137	October 18, 1852	100 00	66 77	166 77
138	October 19, 1852	100 00	66 75	166 75
139	October 23, 1852	100 00	66 67	166 67
140	October 23, 1852	100 00	66 67	166 67
141	October 23, 1852	100 00	66 67	166 67
142	October 25, 1852	100 00	66 63	166 63
143	October 25, 1852	100 00	66 63	166 63
144	October 25, 1852	100 00	66 63	166 63
145	October 25, 1852	100 00	66 63	166 63
146	October 25, 1852	100 00	66 63	166 63
147	October 25, 1852	100 00	66 63	166 63
148	October 27, 1852	100 00	66 59	166 59
149	October 27, 1852	100 00	66 59	166 59
150	October 28, 1852	100 00	66 57	166 57
151	November 1, 1852	100 00	66 51	166 51
152	November 1, 1852	100 00	66 51	166 51
153	November 3, 1852	100 00	66 47	166 47
154	November 13, 1852	100 00	66 28	166 28
155	November 13, 1852	100 00	66 28	166 28
156	November 13, 1852	100 00	66 28	166 28
157	November 16, 1852	100 00	66 22	166 22
158	November 18, 1852	100 00	66 18	166 18
159	November 18, 1852	100 00	66 18	166 18
160	November 22, 1852	100 00	66 10	166 10
161	November 22, 1852	100 00	66 10	166 10
162	November 25, 1852	100 00	66 05	166 05
163	November 25, 1852	100 00	66 05	166 05
219	April 27, 1853	100 00	63 10	163 10
268	August 13, 1853	100 00	61 04	161 04
269	August 13, 1853	100 00	61 04	161 04
270	August 13, 1853	100 00	61 04	161 04
271	August 13, 1853	100 00	61 04	161 04
305	January 19, 1854	100 00	58 20	158 20
306	January 19, 1854	100 00	58 20	158 20
329	March 29, 1854	100 00	56 64	156 64
331	March 31, 1854	100 00	56 60	156 60
332	March 31, 1854	100 00	56 60	156 60
333	March 31, 1854	100 00	56 60	156 60
340	April 12, 1854	100 00	56 39	156 39
341	April 12, 1854	100 00	56 39	156 39
348	April 17, 1854	100 00	56 29	156 29
349	April 17, 1854	100 00	56 29	156 29
353	April 25, 1854	100 00	56 14	156 14
354	April 25, 1854	100 00	56 14	156 14
355	April 25, 1854	100 00	56 14	156 14
356	April 25, 1854	100 00	56 14	156 14
371	May 13, 1854	100 00	55 85	155 85
372	May 13, 1854	100 00	55 85	155 85
373	May 13, 1854	100 00	55 85	155 85
374	May 13, 1854	100 00	55 85	155 85
380	May 26, 1854	100 00	55 53	155 53
381	May 26, 1854	100 00	55 53	155 53
383	June 6, 1854	100 00	55 33	155 33
384	July 10, 1854	100 00	54 67	154 67
386	July 21, 1854	100 00	54 47	154 47
390	August 7, 1854	100 00	54 15	154 15
391	August 11, 1854	100 00	54 07	154 07
394	August 19, 1854	100 00	53 92	153 92
398	September 2, 1854	100 00	53 67	153 67
Amount carried forward		\$6,400 00	\$3,943 52	\$10,343 52

OUTSTANDING SEVEN PER CENT. WAR BONDS, 1852—Continued.

No.	DATE OF BOND.	Amount.	Interest to May 2, 1862.	Total.
	Amount brought forward -----	\$6,400 00	\$3,943 52	\$10,343 52
401	October 23, 1854 -----	100 00	52 68	152 68
402	October 24, 1854 -----	100 00	52 66	152 66
403	November 24, 1854 -----	100 00	52 08	152 08
404	November 24, 1854 -----	100 00	52 08	152 08
405	November 24, 1854 -----	100 00	52 08	152 08
406	November 24, 1854 -----	100 00	52 08	152 08
407	November 24, 1854 -----	100 00	52 08	152 08
409	April 4, 1855 -----	100 00	49 54	149 54
413	July 28, 1855 -----	100 00	47 33	147 33
416	August 1, 1855 -----	100 00	47 27	147 27
417	August 13, 1855 -----	100 00	47 04	147 04
418	August 13, 1855 -----	100 00	47 04	147 04
419	August 13, 1855 -----	100 00	47 04	147 04
420	August 13, 1855 -----	100 00	47 04	147 04
		\$7,800 00	\$4,641 56	\$12,441 56

OUTSTANDING SEVEN PER CENT. WAR BONDS, 1852.

No.	DATE OF BOND.	Amount.	Interest to May 2, 1862.	Total.
69	November 25, 1852 -----	\$250 00	\$165 14	\$415 14
113	February 3, 1854 -----	250 00	144 33	394 33
128	July 10, 1854 -----	250 00	136 70	386 70
129	July 21, 1854 -----	250 00	136 15	386 15
130	July 21, 1854 -----	250 00	136 15	386 15
134	July 21, 1854 -----	250 00	136 15	386 15
135	July 21, 1854 -----	250 00	136 15	386 15
136	July 21, 1854 -----	250 00	136 15	386 15
139	August 24, 1854 -----	250 00	134 55	384 55
141	August 26, 1854 -----	250 00	134 45	384 45
142	August 26, 1854 -----	250 00	134 45	384 45
143	August 26, 1854 -----	250 00	134 45	384 45
145	September 14, 1854 -----	250 00	133 58	383 58
146	September 14, 1854 -----	250 00	133 58	383 58
151	October 18, 1854 -----	250 00	131 93	381 93
152	October 24, 1854 -----	250 00	131 64	381 64
153	October 24, 1854 -----	250 00	131 64	381 64
154	October 24, 1854 -----	250 00	131 64	381 64
155	October 24, 1854 -----	250 00	131 64	381 64
156	October 24, 1854 -----	250 00	131 64	381 64
160	August 1, 1855 -----	250 00	118 17	368 17
161	August 1, 1855 -----	250 00	118 17	368 17
162	August 1, 1855 -----	250 00	118 17	368 17
163	August 15, 1855 -----	250 00	117 50	367 50
164	May 18, 1856 -----	250 00	104 23	354 23
166	May 18, 1856 -----	250 00	104 23	354 23
167	May 18, 1856 -----	250 00	104 23	354 23
168	May 18, 1856 -----	250 00	104 23	354 23
		\$7,000 00	\$3,611 04	\$10,611 04

OUTSTANDING SEVEN PER CENT. WAR BONDS, 1852.

No.	DATE OF BOND.	Amount.	Interest to May 2, 1862.	Total.
186	November 29, 1852 -----	\$500 00	\$329 87	\$829 87
307	May 14, 1853 -----	500 00	313 83	813 83
416	May 13, 1854 -----	500 00	278 92	778 92
420	July 10, 1854 -----	500 00	273 38	773 38
		\$2,000 00	\$1,196 00	\$3,196 00

Interest calculated from date of bond to May 2d, 1862.

OUTSTANDING TWELVE PER CENT. WAR BONDS, 1851.

(Act of February 15th, 1851.)

No.	DATE OF BOND.	Amount.	Interest to Feb. 15, 1861.	Total.
107	April 9, 1851 -----	\$1,000 00	\$1,182 00	\$2,182 00
108	April 9, 1851 -----	1,000 00	1,182 00	2,182 00
142	May 24, 1851 -----	1,000 00	1,167 00	2,167 00
		\$3,000 00	\$3,531 00	\$6,531 00

Interest calculated from date of bond to February 15th, 1861.

Interest and principal on bonds of 1852—\$100 each -----	\$12,441 56
Interest and principal on bonds of 1852—\$250 each -----	10,611 04
Interest and principal on bonds of 1852—\$500 each -----	3,196 00
Interest and principal on bonds of 1851—\$1,000 each -----	6,531 00
Total -----	\$32,779 60

On August 5th, 1854, (United States Statutes at Large, Volume X, page 583,) Congress passed a bill appropriating money to defray expenses incurred by the State of California in suppressing Indian hostilities. Section 3 of said bill reads as follows:

SECTION 3. *And be it further enacted,* That the Secretary of War be and he is hereby authorized and directed to examine into and ascertain the amount of expenses incurred by the State of California in the suppression of Indian hostilities within the said State prior to the 1st day of January, A. D. 1854, and that the amount of such expenses, when so ascertained, be paid into the treasury of said State; *provided,* that the sum so paid shall not exceed in amount the sum of \$924,259 65, which amount is hereby appropriated out of any moneys in the treasury not otherwise appropriated.

Could the above appropriation of \$924,259 65 have been made immediately available, it would have paid up in full, principal and interest, the said bonds under Acts of 1851 and 1852, issued prior to January 1st, 1854; but owing to the ruling of the Honorable Secretary of War, to the effect that the vouchers upon which the said bonds were issued would have to be presented, for examination, to the War Department at Washington, delay was caused, the result of which was, that before the bondholders received their money some two years and eight months elapsed, and the interest coupons from January 1st, 1854 (the date to which interest was paid on bonds redeemed by the United States Government, bearing date prior to January 1st, 1854), to September 1st, 1856, and amounting to \$173,322 66, were cut from the said redeemed bonds and returned to the respective holders of said bonds so presented for redemption; which will more

fully and at large appear by reference to reports made to the Governor of California, by Samuel B. Smith and J. W. Denver, Commissioners California War Debt, which reports bear date, respectively, January 5th, 1857, and January 30th, 1860. (See Appendix to Journals of Senate and Assembly, 19th Session, pages 10, 11, 12, and 13.)

Included in the \$638,100 of the seven per cent. bonds, first herein described, are bonds bearing date after said 1st day of January, 1854, which were issued under the said Act of 1852, and Acts amendatory thereof—a large number of which, both principal and interest, have been paid in full by the United States Government—said government thus acknowledging, to the fullest extent, the validity of the issue of bonds of later date than January 1st, 1854, and the obligation of the General Government to pay the same; all of which will more fully appear by reference to the records of the United States War Department.

The Commissioners of California War Debt give the amount of the detached interest coupons, above alluded to, as \$172,828 54. I make it \$173,322 66, as follows:

Interest on \$197,000, bonds of 1851, for thirty-two months, at 12 per cent. per annum	\$63,040 00
Interest on \$590,800, bonds of 1852, for thirty-two months, at 7 per cent. per annum	110,282 66
Total	\$173,322 66

The Joint Committee of Senate and Assembly, 19th Session, in a report made February 21st, 1872, make the principal of bonds outstanding as follows—

Outstanding principal of bonds under Act of 1851	\$3,000 00
Outstanding principal of bonds under Act of 1852	14,700 00
Total	\$17,700 00

Which is not the true amount. The committee fell into an error by assuming the whole issue under Act of 1852 to be \$636,350, when it should have been \$638,100—thus ignoring an issue of \$1,750 made in 1855 and 1857, under said Act of May 2d, 1852; and then they say the State paid of said bonds, principal, \$23,200, when, in fact, the State only paid as principal on said bonds the sum of \$22,850; the balance paid by the State as principal was \$350 (making \$23,200 paid as principal on said bonds by the State, as appears by record in Controller's office), which was paid to redeem Bond No. 39, for \$250, and Bond No. 343, for \$100, both of which had been previously paid by the General Government, which latter amount of \$350, of course, did not diminish the amount of bonds outstanding. And as we have seen that bonds were issued to the amount of \$1,750 in excess of the amount given by said joint committee, and \$350 less was used by the State to pay principal of said bonds than was stated by said joint committee, consequently, there were less bonds redeemed by the State, by the amount of \$350, than stated by said joint committee, and more issued by the State, by \$1,750 (than stated by said committee); and, therefore, there are bonds outstanding, issued under the Act of May 2d, 1852, amounting to \$2,100 more than said joint committee report; or, in other words, there are of said bonds of 1852, outstanding (principal), \$16,800, instead of \$14,700, making, with the bonds of 1851, \$19,800 now outstanding, which said bonds, by num-

bers, date, and denomination, are given in another part of this communication.

To sum up, the account in tabular form is as follows:

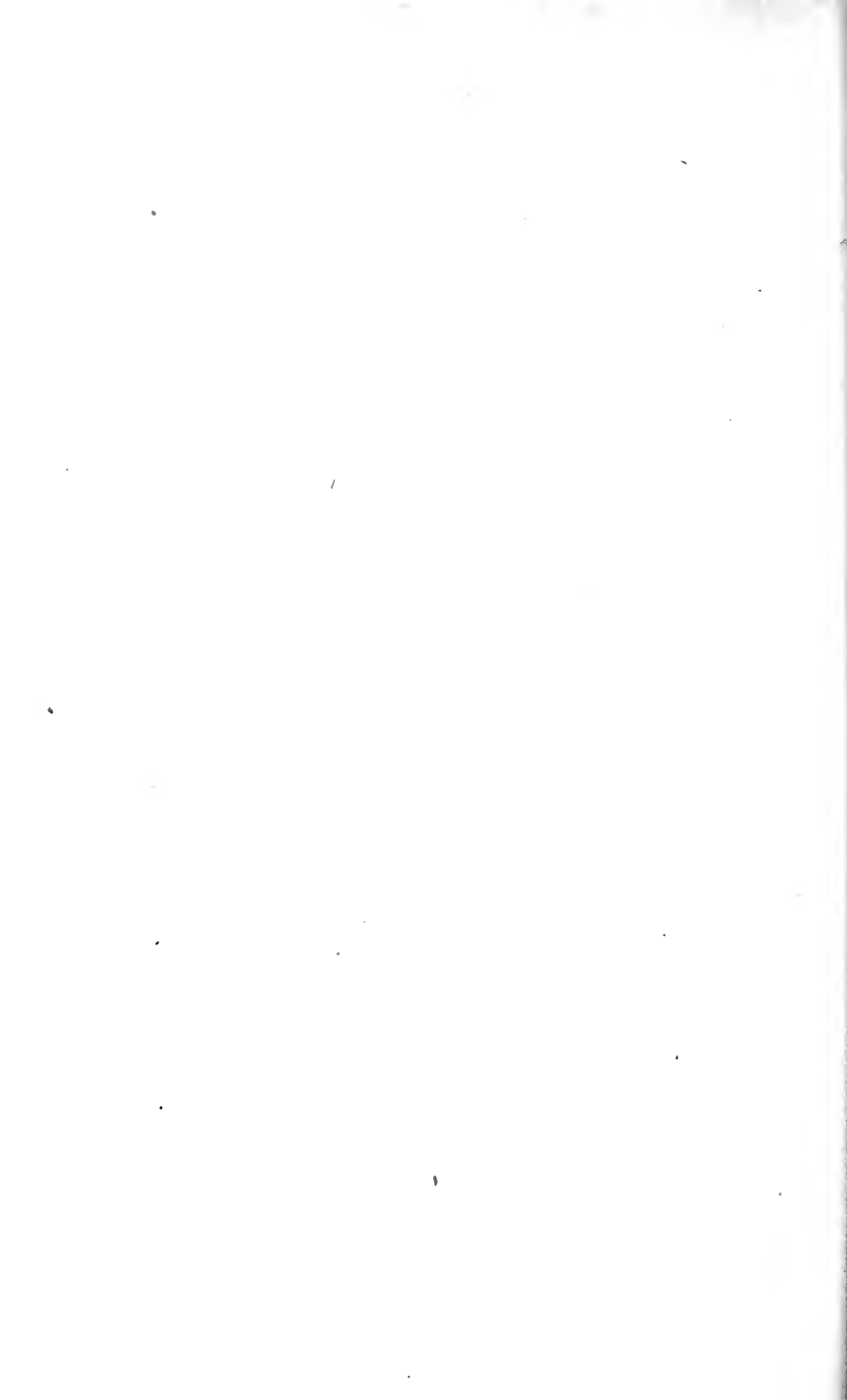
Bonds of 1851 outstanding (principal)	\$3,000 00
Interest on same from date to maturity	3,531 00
Bonds under Act of 1852 outstanding (principal)	16,800 00
Interest on the same from date of bond to May 2d, 1862, time of maturity	9,448 60
Coupons outstanding, cut from bonds of 1851, redeemed by United States Government, said coupons being for interest on said bonds from January 1st, 1854, to September 1st, 1856	63,040 00
Coupons outstanding, cut from bonds of 1852, redeemed by United States Government, said coupons being for interest on said bonds from January 1st, 1854, to September 1st, 1856	110,282 66
Total amount of bonds, principal and interest, outstanding	\$206,102 26

To which amount is to be added the amount of principal and interest of said bonds under Act of May, 1852, paid by the State of California—\$35,523 56—making the sum of \$241,625 82 for which the General Government is justly liable to the State.

All of which is respectfully submitted.

W. B. C. BROWN, Controller.

APPENDIX.



Receipts for the Twenty-ninth Fiscal Year---1877-8.

STATEMENT No. 1.

RECEIPTS FOR THE TWENTY-NINTH FISCAL YEAR.

Statement showing the receipts into the State treasury for the fiscal year commencing July 1st, 1877, and ending June 30th, 1878.

COUNTIES.	Property Tax-----	State School Lands, 500,000-acre Grant— Principal-----	State School Lands, 500,000-acre Grant— Interest-----	State School Lands, 16th and 36th Sec- tions—Principal-----	State School Lands, 16th and 36th Sec- tions—Interest-----	Swamp and Over- flowed Lands—Dis- trict No. 18-----	Reclamation Tax— Levee District No. 5.	State Loan Tax-----	Estates of Deceased Persons-----	Total from Counties--
Alameda-----	\$244,305 66	-----	-----	\$341 77	\$208 89	-----	-----	-----	-----	\$244,856 32
Alpine-----	2,673 02	-----	-----	99 00	188 10	-----	-----	-----	-----	2,960 12
Amador-----	14,000 74	-----	-----	603 90	438 00	-----	-----	-----	-----	15,042 64
Butte-----	61,494 44	-----	-----	1,794 36	691 44	-----	-----	-----	-----	63,980 24
Calaveras-----	10,876 36	-----	-----	578 20	767 39	-----	-----	\$1,782 48	-----	14,004 63
Colusa-----	67,291 79	-----	-----	5,337 56	1,580 73	-----	-----	-----	-----	74,230 08
Contra Costa-----	40,748 19	-----	-----	462 33	129 99	-----	-----	-----	-----	41,340 51
Del Norte-----	3,621 70	-----	-----	-----	-----	-----	-----	-----	-----	3,621 70
El Dorado-----	12,784 18	-----	-----	2,028 40	1,146 16	-----	-----	-----	-----	15,958 74
Fresno-----	32,000 87	-----	\$31 36	2,175 47	2,393 93	-----	-----	-----	-----	36,601 63
Humboldt-----	28,928 82	\$594 00	405 88	1,871 10	1,785 04	-----	-----	-----	\$110 47	33,665 31
Inyo-----	7,943 92	-----	-----	138 60	181 50	-----	-----	-----	-----	8,263 42
Kern-----	25,855 64	-----	-----	2,324 33	679 68	-----	-----	-----	-----	28,859 65
Lake-----	11,871 16	-----	-----	1,820 71	1,115 11	-----	-----	-----	-----	14,806 98
Lassen-----	7,612 32	-----	-----	2,079 00	1,737 35	-----	-----	-----	2 10	11,430 77
Los Angeles-----	89,549 56	-----	-----	2,544 92	2,046 15	-----	-----	-----	40 00	94,180 63
Marin-----	51,155 97	-----	-----	148 50	491 54	-----	-----	-----	-----	51,155 97
Mariposa-----	7,753 54	-----	-----	10,751 51	4,143 96	-----	-----	-----	-----	8,393 58
Mendocino-----	34,804 54	-----	-----	455 40	749 53	-----	-----	-----	-----	49,700 01
Merced-----	26,652 12	-----	-----	486 08	377 22	-----	-----	-----	-----	27,837 05
Modoc-----	5,630 82	-----	-----	44 41	432 29	-----	-----	-----	-----	6,494 12
Mono-----	3,446 90	649 24	-----	-----	44 41	-----	-----	-----	-----	4,582 84
Monterey-----	48,221 01	-----	-----	411 60	1,051 80	-----	-----	-----	-----	49,684 41
Napa-----	46,324 40	-----	-----	2,090 88	992 58	-----	-----	-----	-----	49,407 86
Nevada-----	41,444 38	-----	-----	732 60	442 13	-----	-----	-----	-----	42,619 11
Placer-----	31,482 55	633 60	424 85	1,207 80	909 36	-----	-----	-----	-----	34,658 16

[illegible]

RECEIPTS FOR THE TWENTY-NINTH FISCAL YEAR—Continued.

SOURCES.	Amounts.	Totals.
Total from counties brought forward -----		\$3,463,233 21
<i>Miscellaneous.</i>		
Commutation tax from Commissioner of Immigration -----	\$404 00	
Fees from Secretary of State -----	11,632 00	
Fees from Clerk Supreme Court -----	6,431 30	
Fees from Surveyor-General -----	5,869 95	
Fees from Register State Land Office -----	2,931 50	
Fees from Insurance Commissioner -----	12,173 42	
Hastings College of the Law in University of California —from S. C. Hastings -----	100,000 00	
Interest on bonds held in trust for School Fund —from State bonds -----	\$107,760 00	
Interest on bonds held in trust for School Fund —from county bonds -----	13,831 50	
	121,591 50	
Interest on bonds held in trust for University Fund—from State bonds -----	50,040 00	
Rent of State Capitol Grounds -----	256 00	
Rent of wharves, docks, etc., in San Francisco—from State Harbor Commissioners -----	284,345 06	
Sale of ballot paper -----	4,145 86	
Sale of Codes -----	12 50	
Sale of Geological Survey Reports -----	90 40	
Sale of old carpets, matting, barrels, etc. -----	119 75	
Sale of Statutes of California and Amendments to Codes -----	6 00	
Sale of Supreme Court Reports -----	12 00	
San Pablo and Tulare Railroad Company vs. Lester L. Rob- inson and others -----	8,000 00	
		608,061 24
Total receipts from all sources -----		\$4,071,294 45
Deduct amount of interest on State bonds held in trust for School and University Funds, as this amount is also included in receipts from property tax -----		157,800 00
Making the total actual receipts -----		\$3,913,494 45

Receipts for the Thirtieth Fiscal Year---1878-9.

STATEMENT No. 2.

RECEIPTS FOR THE THIRTIETH FISCAL YEAR.

Statement showing the receipts into the State treasury for the fiscal year commencing July 1st, 1878, and ending June 30th, 1879.

COUNTIES.	Property Tax -----	State School Lands, 500,000-acre Grant— Principal -----	State School Lands, 500,000-acre Grant— Interest -----	State School Lands, 16th and 36th Sec- tions—Principal -----	State School Lands, 16th and 36th Sec- tions—Interest -----	Swamp and Over- flowed Lands—Dis- trict No. 18.-----	Reclamation Tax— Levee District No. 5.-----	State Loan Tax -----	Estates of Deceased Persons -----	Total from Counties...
Alameda -----	\$225,414 62			\$483 12	\$307 35					\$226,205 09
Alpine -----	2,013 54				142 56					2,156 10
Amador -----	12,029 87			782 10	533 37					13,345 34
Butte -----	54,951 11		\$31 68	483 12	331 03					55,786 94
Calaveras -----	8,942 57			83 20	873 48			\$1,798 79		11,850 04
Colusa -----	63,142 93			235 20	560 75					64,495 68
Contra Costa -----	37,002 61			792 00	1,071 60					41,482 99
Del Norte -----	3,279 67			3,498 78	49 94					3,651 82
El Dorado -----	11,252 30			322 21	1,109 47					14,531 49
Fresno -----	32,001 68	\$514 80	93 39	2,169 72	2,259 93					39,473 30
Humboldt -----	28,535 54	287 10	1,975 89	4,603 50	1,599 91					34,706 26
Inyo -----	6,682 02			2,367 82	113 36				\$59 24	6,815 18
Kern -----	30,926 85			19 80	3,004 25					38,174 71
Lake -----	10,554 65		18 51	4,184 37	402 76					12,619 63
Lassen -----	5,806 02	79 20		1,564 51	395 25					7,720 75
Los Angeles -----	85,425 55			1,519 48	775 63				30 00	87,204 29
Marin -----	41,119 08			973 11						41,119 08
Mariposa -----	5,022 53	1,616 51		256 77	308 88					7,204 69
Mendocino -----	29,390 78			3,123 51	2,468 76					34,983 05
Merced -----	28,707 81	1,764 00	73 28	3,469 58	2,007 29					36,021 96
Modoc -----	5,992 87			616 81	477 73					7,057 41
Mono -----	4,415 03			1,928 64	330 99					6,674 66
Monterey -----	36,085 76			89 60	718 96					36,894 32
Napa -----	38,612 41			424 40	306 10					39,342 91
Nevada -----	35,540 63			564 30	487 03					36,591 96
Placer -----	29,096 30	316 80	361 68	207 90	746 35					30,729 03

[illegible]

RECEIPTS FOR THE THIRTIETH FISCAL YEAR—Continued.

SOURCES.	Amounts.	Totals.
Total from counties brought forward		\$3,173,721 41
<i>Miscellaneous.</i>		
Commutation tax from Commissioner of Immigration	\$42 40	
Fees from Secretary of State	10,853 75	
Fees from Clerk Supreme Court	10,008 65	
Fees from Surveyor-General	3,285 00	
Fees from Register State Land Office	2,005 00	
Fees from Insurance Commissioner	12,492 74	
Interest on bonds held in trust for School		
Fund—from State bonds	\$107,760 00	
Interest on bonds held in trust for School		
Fund—from county bonds	17,134 70	
	124,894 70	
Interest on bonds held in trust for University		
Fund—from State bonds	\$58,500 00	
Interest on bonds held in trust for University		
Fund, from city and county bonds	16,545 04	
	75,045 04	
Licenses, incorporated banks, from Bank Commissioners	13,913 60	
Rent of wharves, docks, etc., in San Francisco—from State		
Harbor Commissioners	281,531 43	
Sale of ballot paper	616 30	
Sale of bound volumes Constitution of the United States		
and State of California	1 00	
Sale of Codes	17 50	
Sale of Geological Survey Reports	310 25	
Sale of marble mantel, left with J. C. Devine by a former		
Secretary of State	5 00	
Sale of Statutes of California and Amendments to Codes	89 00	
Sale of Supreme Court Reports	15 00	
St. Helena Water Company vs. A. B. Forbes, from County		
Clerk, Napa County	1,023 00	
		536,149 36
Total receipts from all sources		\$3,709,870 77
Deduct amount of interest on State bonds held in trust for		
School and University Funds, as this amount is also		
included in receipts from property tax		166,260 00
Making the total actual receipts		\$3,543,610 77

Expenditures for the Twenty-ninth Fiscal Year---1877-8.

STATEMENT No. 3.

EXPENDITURES FOR THE TWENTY-NINTH FISCAL YEAR.

Statement showing the amount of each appropriation, the amount expended, the amount unexpended, and the total expended during the fiscal year commencing July 1st, 1877, and ending June 30th, 1878.

Date of Act.	APPROPRIATION.	Balance in Appropriation at close of 28th Fiscal Year.	Amount Expended during 29th Fiscal Year.	Amount Unexpended at close of 29th Fiscal Year.	Total Expended during 29th Fiscal Year.
<i>Legislative Department.</i>					
April 3, 1876	Per diem and mileage of Lieutenant-Governor and Senators	\$52,000 00	\$50,659 30	\$1,340 70	-----
April 3, 1876	Pay of Officers and Clerks of Senate	13,000 00	11,320 00	1,680 00	-----
April 3, 1876	Contingent expenses of Senate	-----	-----	-----	-----
March 29, 1878	Deficiency	-----	-----	-----	-----
April 1, 1878	Deficiency	-----	-----	-----	-----
	Total for Senate	27,500 00	27,500 00	-----	-----
April 3, 1876	Per diem and mileage of Assemblymen	\$102,000 00	\$99,282 00	\$2,718 00	-----
April 3, 1876	Pay of Officers and Clerks of Assembly	14,500 00	12,048 00	2,452 00	-----
April 3, 1876	Contingent expenses of Assembly	-----	-----	-----	-----
April 1, 1878	Deficiency	-----	-----	-----	-----
	Total for Assembly	26,500 00	25,114 12	1,385 88	-----
		-----	-----	-----	136,444 12
<i>Judicial Department.</i>					
April 3, 1876	Salaries of Justices Supreme Court	-----	-----	-----	-----
April 3, 1876	Salaries of District Judges	-----	-----	-----	-----
Feb. 21, 1878	Deficiency, salaries of District Judges, 28th fiscal year	\$114,000 00	-----	-----	-----
Feb. 21, 1878	Deficiency, salaries of District Judges, 29th fiscal year	1,000 00	-----	-----	-----
April 1, 1878	Salary of Judge Twenty-third Judicial District, two and one-half months.	1,250 00	-----	-----	-----
		117,250 00	117,152 78	\$97 22	-----

April 3, 1876	Salary of Clerk Supreme Court	4,000 00	4,000 00		
April 3, 1876	Salary of Deputy Clerk Supreme Court	1,800 00	1,800 00		
April 3, 1876	Salary of Reporter Supreme Court	6,000 00	6,000 00		
April 3, 1876	Salary of Phonographic Reporter of Supreme Court	3,000 00	3,000 00		
April 3, 1876	Salary of Secretary of Justices Supreme Court	3,000 00	3,000 00		
April 3, 1876	Salary of Bailiff and Porter of Supreme Court	1,200 00	1,179 99	20 01	
April 3, 1876	Pay of Porter to Clerk Supreme Court	200 00	200 00		
April 3, 1876	Postage and contingent expenses of Supreme Court	250 00	250 00		
April 3, 1876	Postage and expressage of Clerk Supreme Court	150 00	150 00		
March 30, 1868	Support of Supreme Court Library, fees		2,274 10		
	Total for Judicial Department				169,006 87
<i>Executive Department.</i>					
April 3, 1876	Salary of Governor	\$7,000 00	\$7,000 00		
April 3, 1876	Salary of Private Secretary	2,400 00	2,400 00		
April 3, 1876	Salary of Executive Clerk	2,400 00	2,400 00		
April 3, 1876	Pay of Porter	600 00	600 00		
April 3, 1876	Special contingents, secret service	3,094 50	1,514 65	\$1,579 85	
April 3, 1876	Postage, expressage, and telegraphing	500 00	300 00	200 00	
April 3, 1876	Postage, expressage, and telegraphing, 28th fiscal year, balance	250 00	149 64	100 36	
	Total for Governor's office				14,364 29
April 3, 1876	Salary of Secretary of State	\$4,000 00	\$4,000 00		
April 3, 1876	Salary of Deputy Secretary of State	2,400 00	2,400 00		
April 3, 1876	Salaries of Clerks	9,500 00	9,500 00		
April 3, 1876	Pay of Porter	150 00	150 00		
April 3, 1876	Postage, expressage, and telegraphing	1,400 00	787 55	\$612 45	
April 3, 1876	Postage, expressage, and telegraphing, 27th fiscal year, balance		84 84	84 84	
April 3, 1876	Postage, expressage, etc., deficiency, 27th fiscal year	165 16	165 16		
Feb. 21, 1878	Postage, expressage, etc., deficiency, 27th fiscal year	733 17	733 17		
Feb. 21, 1878	Postage, expressage, etc., deficiency, 28th fiscal year				
April 3, 1876	Contingent expenses	100 00	100 00		
	Total for Secretary of State's office				18,020 72
	Amount carried forward				\$427,315 30

EXPENDITURES FOR THE TWENTY-NINTH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Balance in Appropriation at close of 28th Fiscal Year.	Amounts Expended during 29th Fiscal Year.	Amount Unexpended at close of 29th Fiscal Year.	Total Expended during 29th Fiscal Year.
April 3, 1876	Amount brought forward				\$427,315 30
April 3, 1876	Salary of Controller	\$4,000 00	\$4,000 00		
April 3, 1876	Salary of Deputy Controller	3,000 00	3,000 00		
April 3, 1876	Salary of Book-keeper	2,400 00	2,400 00		
April 3, 1876	Salaries of Clerks	10,800 00	7,200 00	\$3,600 00	
April 3, 1876	Pay of Porter	300 00	300 00		
April 3, 1876	Postage and expressage	883 03	156 70	726 33	
April 3, 1876	Contingent expenses	153 60	56 58	96 75	
	Total for Controller's office				17,113 55
April 3, 1876	Salary of Treasurer	\$4,000 00	\$4,000 00		
April 3, 1876	Salaries of Clerks	4,200 00	4,200 00		
April 3, 1876	Salaries of Watchmen	2,400 00	2,400 00		
April 3, 1876	Pay of Porter	150 00	150 00		
April 3, 1876	Postage and expressage	150 00	150 00		
	Total for State Treasurer's office				10,900 00
April 3, 1876	Salary of Attorney-General	\$4,000 00	\$4,000 00		
April 3, 1876	Salary of Clerk	1,800 00	1,800 00		
April 3, 1876	Pay of Porter	100 00	100 00		
April 3, 1876	Costs and expenses of suits where the State is a party in interest	4,697 50	3,481 25	\$1,216 25	
April 1, 1878	Costs and expenses of suits where State is a party in interest, deficiency for 28th fiscal year	12 15	12 15		
April 3, 1876	Postage of Attorney-General	100 00	100 00		
	Total for Attorney-General's office				9,493 40
April 3, 1876	Salary of Surveyor-General	\$2,000 00	\$2,000 00		
April 3, 1876	Salary of Deputy	2,400 00	2,400 00		
April 3, 1876	Salaries of Clerks	5,400 00	3,300 00	\$2,100 00	
April 3, 1876	Pay of Porter	300 00	300 00		
April 3, 1876	Postage and expressage	125 00	125 00		

April 3, 1876	Purchase of maps	400 00	300 00	400 00	
April 3, 1876	Copying maps	300 00			
	Total for Surveyor-General's office				8,425 00
April 3, 1876	Salary of Register State Land Office	\$2,000 00	\$2,000 00		
April 3, 1876	Salaries of Clerks	3,600 00	3,600 00		
April 3, 1876	Postage and expressage	275 00	125 00	\$150 00	
	Total for State Land Office				5,725 00
April 3, 1876	Salary of Superintendent Public Instruction	\$3,000 00	\$3,000 00		
April 3, 1876	Salary of Deputy	1,800 00	1,800 00		
April 3, 1876	Salary of Clerk	1,500 00	1,500 00		
April 3, 1876	Pay of Porter	200 00	200 00		
April 3, 1876	Postage and expressage	913 29	913 29		
Feb. 21, 1878	Postage and expressage, deficiency, 28th fiscal year	87 05	87 05		
April 3, 1876	Traveling expenses	1,940 00	1,151 00	\$780 00	
April 3, 1876	Contingent expenses	113 10	34 17	78 93	
	Total for office Superintendent Public Instruction				8,685 51
April 3, 1876	Salary of Secretary State Board of Health	\$2,500 40	\$2,500 00	40	
April 3, 1876	Mileage and contingent expenses	2,466 00	851 15	\$1,614 85	
	Total for State Board of Health				3,351 15
April 3, 1876	Salaries of members State Board of Examiners	\$3,500 00	\$3,500 00		
April 3, 1876	Salary of Clerk Board of Examiners	1,200 00	1,200 00		
	Total for State Board of Examiners				4,700 00
April 3, 1876	Salary of State Librarian	\$3,000 00	\$3,000 00		
April 3, 1876	Salaries of Deputies	3,600 00	3,600 00		
April 3, 1876	Pay of Porter	600 00	600 00		
April 3, 1876	Postage and expressage	200 00	166 30	\$33 70	
May 17, 1861	Support of State Library*		5,287 63		
	Total for State Library				12,633 93
	Amount carried forward				\$508,362 84

* Fees Secretary of State.

EXPENDITURES FOR THE TWENTY-NINTH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Balance in Appropriation at close of 28th Fiscal Year.	Amount Expended during 29th Fiscal Year.	Amount Unexpended at close of 29th Fiscal Year.	Total Expended during 29th Fiscal Year.
April 3, 1876.	Amount brought forward				\$508,362 84
April 3, 1876.	Salary of Insurance Commissioner	\$3,000 00	\$3,000 00		
April 3, 1876.	Salary of Clerk	1,800 00	1,800 00		
April 3, 1876.	Rent and contingent expenses	2,968 10	2,782 00	\$186 10	
	Total for office Insurance Commissioner				7,582 00
April 3, 1876.	Salary of Superintendent State Printing	\$2,400 00	\$2,400 00		
April 3, 1876.	Support of State Printing Office				
	Transfer from repair and purchase of machinery			\$60,181 56	
	Transfer from wages temporary employes, etc.			107 03	
				118 27	
April 3, 1876.	Repair and purchase of machinery	60,406 86	60,091 02	\$315 84	
	Less transfer as above				
	Wages temporary employes, etc.	1,078 99	1,078 99		
April 3, 1876.	Less transfer as above				
	Total for State Printing Office	1,639 73	1,639 73		
April 3, 1876.	Salaries of Transportation Commissioners	\$9,000 00	\$7,674 99	\$1,325 01	
April 3, 1876.	Salary of Clerk	1,800 00	1,800 00		
April 3, 1876.	Contingent expenses	300 00	300 00		
Feb. 21, 1878.	Contingent expenses, deficiency for 29th fiscal year.	249 30	249 30		
	Total for Transportation Commissioners				10,024 29
April 3, 1876.	Salaries and expenses of State Land Commission	\$1,258 05	\$70 00	\$1,188 05	
	Total for State Land Commission				70 00
March 30, 1878.	Salaries of Bank Commissioners		\$941 65		
March 30, 1878.	Salary of Clerk		150 00		
	Total for Bank Commissioners				1,091 65

April 3, 1876-----	Pay of permanent employes Capitol building and grounds-----	\$14,950 00	\$14,400 00	\$550 00	-----
April 3, 1876-----	Permanent improvement State Capitol grounds-----	2,939 91	2,939 91	-----	-----
March 29, 1878-----	Permanent improvement State Capitol grounds, deficiency for 29th fiscal year-----	8,000 00	7,942 81	57 19	-----
April 3, 1876-----	Painting State Capitol-----	6,331 07	6,331 06	01	-----
April 3, 1876-----	Repairing and painting roof-----	4,940 25	3,106 35	1,833 90	-----
March 29, 1878-----	Repair and furnishing State Capitol-----	8,529 56	8,274 52	255 04	-----
March 2, 1866-----	Construction State Capitol (Capitol Fund)-----	342 35	342 35	-----	-----
Total for Capitol building and grounds-----		-----	-----	43,337 00	-----
April 1, 1876-----	Relief of James W. Marshall-----	\$1,000 00	\$1,000 00	-----	-----
Feb. 25, 1878-----	Relief of Julius Blume-----	300 00	300 00	-----	-----
March 14, 1878-----	Relief of John A. Odell-----	1,300 00	1,300 00	-----	-----
March 26, 1878-----	Relief of John Q. Hendricks, Chas. Carroll, and R. D. Hubbard-----	300 00	300 00	-----	-----
March 29, 1878-----	Relief of Frederick Kuhnle-----	300 00	300 00	-----	-----
March 30, 1878-----	Relief of Edward Christy-----	390 00	390 00	-----	-----
April 1, 1878-----	Relief of the sufferers by the late floods (to the Howard Benevolent Association at Sacramento)-----	5,000 00	5,000 00	-----	-----
April 1, 1878-----	Relief of Richard Dudding and William Johnston-----	154 00	154 00	-----	-----
Jan. 23, 1878-----	Payment of claim of C. H. Krebs, assignee of J. G. Plummer-----	3,427 90	3,427 90	-----	-----
Feb. 16, 1878-----	Payment of claim of County of Sacramento-----	3,653 67	3,653 67	-----	-----
March 2, 1878-----	Payment of claim of Harrison Roberts, Latis Ruggio, and C. S. Colvig (capture of Chavez)-----	2,199 42	2,199 42	-----	-----
March 23, 1878-----	Payment of claim of Mary M. Springer-----	7,000 00	7,000 00	-----	-----
March 23, 1878-----	Payment of claim of J. W. C. Coleman-----	426 90	426 90	-----	-----
March 26, 1878-----	Payment of claim of Hiram Clock-----	120 00	120 00	-----	-----
March 26, 1878-----	Payment of claim of P. K. Stockton-----	285 00	285 00	-----	-----
March 30, 1878-----	Payment of claim of John Sutherland, Jr-----	300 00	300 00	-----	-----
March 30, 1878-----	Payment of claim of F. E. Baker-----	162 40	162 40	-----	-----
March 30, 1878-----	Payment of claim of John C. Boggs-----	600 00	600 00	-----	-----
Total for relief, etc.-----		-----	-----	26,919 29	-----
April 3, 1876-----	Aid to Magdalen Asylum, San Francisco-----	\$2,500 00	\$2,500 00	-----	-----
April 3, 1876-----	San Francisco Female Hospital-----	3,000 00	3,000 00	-----	-----
April 3, 1876-----	Ladies' Protection and Relief Society, San Francisco-----	3,750 00	3,750 00	-----	-----
April 3, 1876-----	California State Woman's Hospital, San Francisco-----	2,000 00	2,000 00	-----	-----
April 3, 1876-----	San Francisco Lying-in and Foundling Hospital-----	3,000 00	3,000 00	-----	-----
April 3, 1876-----	Protestant Episcopal Church Home, San Francisco-----	500 00	500 00	-----	-----
April 3, 1876-----	Old Woman's Home, Rincon Hill, San Francisco-----	750 00	750 00	-----	-----
Amounts carried forward-----		\$15,500 00	\$15,500 00	\$662,596 81	-----

EXPENDITURES FOR THE TWENTY-NINTH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Balance in Appropriation at close of 29th Fiscal Year.			Amount Expended during 29th Fiscal Year.	Amount Unexpended at close of 29th Fiscal Year.	Total Expended during 29th Fiscal Year.
		Balance in Appropriation at close of 29th Fiscal Year.	Amount Expended during 29th Fiscal Year.	Amount Unexpended at close of 29th Fiscal Year.			
April 3, 1876	Amounts brought forward	\$15,500 00	\$15,500 00				\$662,596 81
April 3, 1876	Little Sisters' Infant Shelter, San Francisco.	1,000 00	1,000 00				
April 3, 1876	Sisters of Mercy Hospital, Los Angeles.	1,000 00	1,000 00				
April 3, 1876	Howard Benevolent Association, Sacramento	1,250 00	1,250 00				
April 3, 1876	Stockton Ladies' Benevolent Association	500 00	500 00				
April 3, 1876	Marysville Benevolent Association	500 00	500 00				
April 3, 1876	Napa Ladies' Relief and Protection Society	500 00	500 00				
April 3, 1876	Ladies' Benevolent Society of Placerville	250 00	250 00				
April 3, 1876	St. Vincent de Paul Society, San José	750 00	750 00				
April 3, 1876	St. Luke's Hospital, San Francisco	250 00	250 00				
April 3, 1876	Scandinavian Ladies' Home, San Francisco	500 00	500 00				
April 3, 1876	Ladies' Relief Society, Sacramento	500 00	500 00				
April 3, 1876	California Prison Commission	1,000 00	1,000 00				
April 3, 1876	Vallejo Ladies' Benevolent Association	500 00	500 00				
April 3, 1876	Oakland Ladies' Relief Society	500 00	500 00				
April 3, 1876	San José Ladies' Benevolent Society	500 00	500 00				
April 3, 1876	San Diego Benevolent Society	500 00	500 00				
April 3, 1876	Pacific Dispensary for Women and Children, San Francisco	500 00	500 00				
April 3, 1876	Grass Valley Ladies' Relief Society	500 00	500 00				
April 3, 1876	Nevada City Benevolent Society	500 00	500 00				
April 3, 1876	Ladies' Aid Society, Petaluma	500 00	500 00				
	Total special aid to charitable institutions				27,500 00		
March 30, 1874	Support of inmates of Orphan Asylums, 27th fiscal year		\$180 57				
April 3, 1876	Support of inmates of Orphan Asylums, 28th fiscal year		28,393 81				
April 3, 1876	Support of inmates of Orphan Asylums, 29th fiscal year		78,085 23				
	Total for Orphan Asylums					106,659 61	
April 3, 1876	Education and care of deaf, dumb, and blind.	\$36,000 00	\$30,000 00			\$6,000 00	
April 3, 1876	Construction of building for deaf, dumb, and blind.	110,000 00	110,000 00				
	Total for deaf, dumb, and blind						140,000 00

April 3, 1876	Support of Insane Asylum of California, at Stockton	\$217,500 00	\$200,202 25	\$17,297 75	
April 1, 1876	Completion of Napa State Asylum for the Insane	46,751 40	46,751 40		
April 3, 1876	Furnishing and support of Branch Insane Asylum, at Napa	110,000 00	110,000 00		
March 30, 1878	Support and maintenance of Napa State Asylum for the Insane, deficiency for the 27th fiscal year	13,420 00	13,420 00		
April 3, 1876	Transportation of insane	42,313 05	19,219 70	23,093 35	
	Total for Insane Asylums				389,593 35
April 3, 1876	Support of State Prison	\$120,000 00	\$120,000 00		
April 3, 1876	Support of State Prison, 28th fiscal year	275 00	275 00		
March 8, 1878	Support of State Prison, deficiency	110,000 00	98,000 00	\$12,000 00	
March 31, 1876	Construction of workshop, etc., California State Prison	45,000 00	45,000 00		
March 30, 1874	Transportation of prisoners, 27th fiscal year	1,903 40	20 50	1,882 90	
April 3, 1876	Transportation of prisoners, 28th fiscal year				
Feb. 21, 1878	Deficiency for 28th fiscal year	888 59			
April 1, 1878	Deficiency for 28th fiscal year	2,248 01			
	Deficiency for 28th fiscal year	51 30			
April 3, 1876	Transportation of prisoners, 29th fiscal year	2,387 90	2,387 90		
	Total for State Prison	23,000 00	21,911 17	3,088 83	
					287,594 57
April 3, 1876	Official advertising, 28th fiscal year	\$866 00	\$608 00	\$258 00	
April 3, 1876	Official advertising, 29th fiscal year	2,500 00	1,879 75	620 25	
March 17, 1876	Printing paper and official advertisements, deficiency for 26th and 27th fiscal years	2,078 11	33 75	2,011 36	
	Total for official advertising				2,521 50
April 3, 1876	Stationery, fuel, lights, etc., for Legislature and State officers	\$17,033 45	\$16,919 11	\$114 31	
Feb. 21, 1878	Deficiency for 27th fiscal year	7,251 11	7,251 11		
	Total for stationery, fuel, lights, etc.				21,170 25
	Amount carried forward				\$1,640,636 09

EXPENDITURES FOR THE TWENTY-NINTH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Balance in Appropriation at close of 28th Fiscal Year.	Amount Expended during 29th Fiscal Year.	Amount Unexpended at close of 29th Fiscal Year.	Total Expended during 29th Fiscal Year.
April 3, 1876	Amount brought forward				\$1,640,636 09
	Traveling expenses of Surveyor-General and Attorney-General, 28th fiscal year	\$700 50	\$430 00	\$320 00	
	Unexpended balance, 28th fiscal year				
	Appropriation for 29th fiscal year	1,070 00	\$55 00	215 00	
March 30, 1874	Traveling expenses United States Surveyor-General, Attorney-General, and Surveyor-General, 27th fiscal year	97 00	95 00	2 00	
	Total for traveling expenses United States Surveyor-General, Attorney-General, and Surveyor-General				1,380 00
March 26, 1872	Support of State University (interest on bonds)		\$51,244 47		
	Total for State University				51,244 47
April 3, 1876	Construction of Mechanical Arts College building, 28th and 29th fiscal years	\$40,000 00	\$12,332 45	\$27,667 55	
	Total for construction of Mechanical Arts College building				12,332 45
April 3, 1876	Support of State Normal School	\$24,477 15	\$24,477 15		
April 3, 1876	Purchase of books for State Normal School	640 75	640 75		
Feb. 21, 1878	Repairs and furniture for State Normal School, deficiency for 28th fiscal year	29 09	29 09		
	Total for State Normal School				25,146 99
April 3, 1876	Traveling expenses of State Board of Education	\$830 00	\$99 00	\$731 00	
April 3, 1876	Services of State Board of Examination	1,000 00	700 00	300 00	
	Total for State Educational Boards				799 00

For support of schools.

Alameda County	\$99,013 97	\$99,013 97	
Alpine County	899 84	899 84	
Anador County	20,435 84	20,435 84	
Butte County	30,199 89	30,199 89	
Calaveras County	16,694 40	16,694 40	
Colusa County	21,312 00	21,312 00	
Contra Costa County	26,253 22	26,253 22	
Del Norte County	3,536 21	3,536 21	
El Dorado County	19,212 37	19,212 37	
Fresno County	14,910 50	14,910 50	
Humboldt County	28,131 84	28,131 84	
Inyo County	3,915 09	3,915 09	
Kern County	8,848 42	8,848 42	
Lake County	13,110 82	13,110 82	
Lassen County	5,738 45	5,738 45	
Los Angeles County	81,277 65	81,277 65	
Marin County	14,926 29	14,926 29	
Mariposa County	7,893 33	7,893 33	
Mendocino County	26,190 08	26,190 08	
Merced County	8,887 89	8,887 89	
Modoc County	7,269 76	7,269 76	
Mono County	1,310 29	1,310 29	
Monterey County	27,200 42	27,200 42	
Napa County	24,595 62	24,595 62	
Nevada County	40,003 41	40,003 41	
Placer County	22,140 80	22,140 80	
Plumas County	8,074 88	8,074 88	
Sacramento County	54,937 60	54,937 60	
San Benito County	11,721 60	11,721 60	
San Bernardino County	17,610 02	17,610 02	
San Diego County	13,363 41	13,363 41	
San Francisco County	420,004 26	420,004 26	
San Joaquin County	41,337 38	41,337 38	
San Luis Obispo County	20,214 82	20,214 82	
San Mateo County	19,899 09	19,899 09	
Santa Barbara County	21,856 64	21,856 64	
Santa Clara County	72,437 12	72,437 12	
Santa Cruz County	29,394 77	29,394 77	
Shasta County	13,323 94	13,323 94	
Amounts carried forward	\$1,318,083 93	\$1,318,083 93	\$1,731,539 00

Apportion-
ments of Au-
gust 6, 1877,
and February
16, 1878.

EXPENDITURES FOR THE TWENTY-NINTH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Balance in Appropriation at close of 28th Fiscal Year.	Amount Expended during 29th Fiscal Year.	Amount Unexpended at close of 29th Fiscal Year.	Total Expended during 29th Fiscal Year.
Apportionments of August 6, 1877, and February 16, 1878.	Amounts brought forward	\$1,318,083 93	\$1,318,083 93		\$1,731,539 00
	Sierra County	8,958 93	1,313 33	\$7,445 60	
	Siskiyou County	14,586 88	2,464 00	12,122 88	
	Solano County	36,119 89	36,119 89		
	Sonoma County	59,839 36	59,839 36		
	Stanislaus County	13,971 20	13,971 20		
	Sutter County	12,400 42	12,400 42		
	Tehama County	14,871 04	14,871 04		
	Trinity County	5,375 36	5,375 36		
	Tulare County	26,474 24	26,474 24		
	Tuolumne County	14,192 21	14,192 21		
	Ventura County	10,821 76	10,821 76		
	Yolo County	24,043 09	24,043 09		
	Yuba County	19,457 06	19,457 06		
Apportionment of Feb. 21, 1877	Siskiyou County, 28th fiscal year	\$1,579,195 37	\$1,559,626 89	\$19,568 48	
Act of March 28, 1868	Total for support of schools	11,859 00	11,859 00		
	Purchase of bonds for School Fund				1,571,485 89
	Total for purchase of bonds for School Fund		\$66,571 15		
					66,571 15
March 28, 1868	Annulment of certificates of purchase	\$5,910 47	\$5,910 47		
April 4, 1870	Restitution of money for lands sold not the property of the State	7,871 40	7,871 40		
April 3, 1876	Services of Registers and Receivers of United States Land Office, 28th and 29th fiscal years	6,000 00	118 00	\$5,882 00	
	Total for lands				13,899 87
April 27, 1863	Payment of interest on Soldiers' Relief bonds	\$6,685 00	\$6,685 00		
April 4, 1864	Payment of interest on Pacific Railroad bonds	105,000 00	105,000 00		

April 4, 1870-----	Payment of interest on State Capitol bonds of 1870-----	17,500 00	17,500 00	17,500 00	314,745 00
March 28, 1872-----	Payment of interest on State Capitol bonds of 1872-----	17,500 00	17,500 00	17,500 00	1,155 00
April 2, 1870-----	Payment of interest on civil bonds of 1873-----	168,000 00	168,000 00	168,000 00	6,300 00
	Total annual interest on bonds-----				
Feb. 20, 1872-----	Payment of canceled coupons-----	\$1,155 00	\$1,155 00	\$1,155 00	1,155 00
March 25, 1874-----	Payment of interest on Levee District No. 5 bonds, Sutter County-----	6,300 00	6,300 00	6,300 00	6,300 00
April 28, 1857-----	Redemption of civil bonds of 1857 : Amount of bonds----- Accrued interest-----	\$8,000 00 252 73			8,252 73
April 3, 1876-----	Salary of Adjutant-General-----	3,000 00	3,000 00	3,000 00	8,252 73
April 3, 1876-----	Salary of Assistant Adjutant-General-----	2,000 00	2,000 00	2,000 00	
April 3, 1876-----	Pay of Porter in office of Adjutant-General-----	300 00	300 00	300 00	
April 3, 1876-----	Postage and expressage-----	100 00	100 00	100 00	
Feb. 21, 1878-----	Postage and expressage, deficiency for 27th fiscal year-----	60	60	60	
April 3, 1876-----	Cleaning and transportation of arms-----	1,251 85	645 30	\$636 55	
March 30, 1874-----	Payment of Army rents, etc., 27th fiscal year-----	2,395 57	405 00	1,990 57	
March 30, 1876-----	Payment of Army rents, etc., deficiency for 26th and 27th fiscal years-----	6,473 62	3,159 00	3,314 62	
April 3, 1876-----	Payment of Army rents, etc., 28th and 29th fiscal years-----	41,229 00	29,163 00	12,066 00	
March 29, 1878-----	Payment of Guard and military duty performed in San Francisco, in November, 1877, and January, 1878-----	5,202 00	5,202 00	5,202 00	
April 1, 1878-----	Relief of the Oakland Guard-----	1,250 00	1,250 00	1,250 00	
	Total for military purposes-----				45,924 90
	Estate of J. L. Folsom, deceased (claim of Main & Winchester)-----		\$29 31		
	Sundry estates of deceased persons (counsel fees)-----		155 71		
	Total from estates of deceased persons-----				185 02
Feb. 28, 1876-----	Improvements of wharves, docks, etc., in San Francisco-----	\$470,712 80	\$470,712 80		
	Total for San Francisco Harbor improvements-----				170,712 80
	Amount carried forward-----				\$3,930,071 36

EXPENDITURE FOR THE TWENTY-NINTH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Balance in Appropriation at close of 28th Fiscal Year.	Amount Expended during 29th Fiscal Year.	Amount Unexpended at close of 29th Fiscal Year.	Total Expended during 29th Fiscal Year.
	<i>Miscellaneous.</i>				
April 3, 1876.	Amount brought forward				\$3,930,071 36
Feb. 21, 1878	Arresting criminals without the limit of the State	\$1,500 00			
April 1, 1878.	Deficiency for 28th fiscal year	1,803 30			
	Deficiency for 29th fiscal year	3,000 00			
April 3, 1876.	Payment of rewards offered by the Governor	\$6,303 30	\$1,775 25	\$4,528 05	
April 3, 1876.	Payment of rewards for arrest and conviction of highway robbers	3,700 00	2,300 00	1,400 00	
Feb. 21, 1878.	Deficiency for 28th fiscal year				
Feb. 21, 1878.	Deficiency for 29th fiscal year	\$1,500 00			
April 1, 1878.	Deficiency for 29th fiscal year	4,800 00			
	Deficiency for 29th fiscal year	1,200 00			
	Deficiency for 29th fiscal year	3,000 00			
March 29, 1878.	Expenses to provide a system of irrigation, etc., and to improve the navigation of the Sacramento and San Joaquin Rivers.	10,500 00	9,600 00	900 00	
Feb. 1, 1878.	Erection and maintenance of Branch State Prison at Folsom, deficiency	100,000 00	2,997 16	97,002 84	
	Per diem and mileage of Presidential Electors of 1876:	300 00	300 00		
	Act of February 14, 1878				
	Act of March 2, 1878				
		\$177 50			
		35 20			
April 3, 1876.	Redemption of stamps sold by the State	212 70	212 70		
April 3, 1876.	Restoration and preservation of fish	1,377 67	\$98 70	478 97	
April 3, 1876.	Translating into Spanish laws of 21st Session of the Legislature	5,000 00	5,000 00		
		1,250 00	125 36	1,124 64	
	Total for miscellaneous purposes				23,209 17
	Total expenditures from all sources.				\$3,953,280 53
	Deduct amount paid for interest on State bonds held in trust by State Treasurer, \$157,800, as this amount is included twice in expenditures, to wit: in the payment of interest on bonds, and in the support of Common Schools and State University				157,800 00
	Making the total actual expenditures				\$3,795,480 53

RECAPITULATION

Of expenditures for the 29th fiscal year.

FOR WHAT PURPOSE EXPENDED.	Amount.
Legislative Department.....	\$225,923 42
Judicial Department.....	169,006 87
Governor's office.....	14,364 29
Secretary of State's office.....	18,020 72
Controller's office.....	17,113 55
Treasurer's office.....	10,900 00
Attorney-General's office.....	9,493 40
Surveyor-General's office.....	8,425 00
Register State Land Office.....	5,725 00
Superintendent of Public Instruction's office.....	8,685 51
State Board of Health.....	3,351 15
State Board of Examiners.....	4,700 00
State Library.....	12,653 93
Insurance Commissioner's office.....	7,582 00
State Printing Office.....	65,209 74
State Board of Transportation Commissioners.....	10,024 29
State Land Commission.....	70 00
Bank Commissioners.....	1,091 65
Capitol building and grounds.....	43,337 00
Relief and payment of claims.....	26,919 29
Charitable institutions.....	27,500 00
Orphan Asylums.....	106,659 61
Deaf, Dumb, and Blind Institution.....	140,000 00
Insane Asylums and transportation of insane.....	389,593 35
State Prison, San Quentin, and transportation of prisoners.....	287,594 57
Official advertising.....	2,521 50
Stationery, fuel, lights, etc., for members of Legislature and State officers.....	24,170 25
Traveling expenses United States Surveyor-General, Attorney-General, and Surveyor-General.....	1,380 00
State University.....	51,244 47
Mechanical Arts College building.....	12,332 45
State Normal School.....	25,146 99
State Educational Boards.....	799 00
Support of schools.....	1,571,485 89
Purchase of bonds for School Fund.....	66,571 15
Lands.....	13,899 87
Payment of interest on bonds of the State of California.....	\$314,745 00
Less interest on bonds held in trust by State Treasurer and paid into School and University Funds.....	157,800 00
	156,945 00
Payment of canceled coupons.....	1,155 00
Payment of interest on Levee District No. 5 bonds, Sutter County.....	6,300 00
Redemption of civil bonds of 1857.....	8,252 73
Military purposes.....	45,224 90
Estates of deceased persons.....	185 02
Improvement of wharves, docks, etc., in San Francisco.....	170,712 80
Miscellaneous purposes, as per preceding page.....	23,209 17
Total expenditures.....	\$3,795,480 53

Expenditures for the Thirtieth Fiscal Year, 1878-9.

STATEMENT No. 4.

EXPENDITURES FOR THE THIRTIETH FISCAL YEAR.

Statement showing the amount of each appropriation, the amount expended, the amount unexpended, and the total expended during the fiscal year commencing July 1st, 1878, and ending June 30th, 1879.

Date of Act.	APPROPRIATION.	Amount of Appropriation for 30th and 31st Fiscal Years.	Amount Expended during 30th Fiscal Year.	Amount Unexpended at close of 30th Fiscal Year.	Total Expended during 30th Fiscal Year.
	<i>Constitutional Convention.</i>				
March 30, 1878	Expenses of Constitutional Convention	\$150,000 00	\$133,256 83		
	Paid per diem and mileage of Delegates		9,690 37		
	Paid officers and attaches		7,052 80		
	Paid printing and contingent expenses				
	Total for Constitutional Convention				\$150,000 00
	<i>Judicial Department.</i>				
April 1, 1878	Salaries of Justices Supreme Court	\$60,000 00	\$50,000 00	\$30,000 00	
April 1, 1878	Salaries of District Judges	212,000 00	121,000 00	121,000 00	
April 1, 1878	Salary of Clerk Supreme Court	8,000 00	4,000 00	4,000 00	
April 1, 1878	Salaries of Deputy Clerks Supreme Court	10,800 00	4,950 00	5,850 00	
April 1, 1878	Salary of Reporter Supreme Court	12,000 00	6,000 00	6,000 00	
April 1, 1878	Salary of Photographic Reporter Supreme Court	6,000 00	3,000 00	3,000 00	
April 1, 1878	Salary of Secretary of Justices Supreme Court	6,000 00	3,000 00	3,000 00	
April 1, 1878	Salary of Bailiff and Porter of Supreme Court	2,400 00	1,200 00	1,200 00	
April 1, 1878	Pay of Porter to Clerk Supreme Court	400 00	200 00	200 00	
April 1, 1878	Postage and contingent expenses Clerk Supreme Court	500 00	227 38	272 62	
April 1, 1878	Postage and contingent expenses Supreme Court	500 00	250 00	250 00	
April 1, 1878	Making analytical index of cases filed in Supreme Court	5,000 00	506 00	4,494 00	
April 1, 1878	Expenses of Supreme Court under Section 51, Code Civil Procedure	30,000 00	8,985 97	21,014 03	
March 30, 1868	Support of Supreme Court Library	(Fees.)	1,513 70		
	Total for Judicial Department				184,923 05
	<i>Executive Department.</i>				
April 1, 1878	Salary of Governor	\$14,000 00	\$7,000 00	\$7,000 00	
April 1, 1878	Salary of Private Secretary to Governor	4,800 00	2,400 00	2,400 00	

April 1, 1878.	Salary of Executive Clerk	4,800 00	2,400 00	2,400 00	2,400 00
April 1, 1878.	Pay of Porter	1,200 00	600 00	600 00	600 00
April 1, 1878.	Special contingents (secret service)	5,000 00	2,200 00	2,800 00	2,800 00
April 3, 1876.	Special contingents (secret service), 29th fiscal year	1,579 85	30 52	1,549 33	1,549 33
April 1, 1878.	Postage, expressage, and telegraphing	1,000 00	238 49	761 51	761 51
April 3, 1876.	Postage, expressage, and telegraphing, 29th fiscal year	300 36	13 42	286 94	286 94
	Total for Governor's office				14,882 43
April 1, 1878.	Salary of Secretary of State	\$8,000 00	\$4,000 00	\$4,000 00	\$4,000 00
April 1, 1878.	Salary of Deputy Secretary of State	4,800 00	2,400 00	2,400 00	2,400 00
April 1, 1878.	Salaries of Clerks	17,700 00	8,095 00	9,605 00	9,605 00
April 1, 1878.	Pay of Porter	300 00	150 00	150 00	150 00
April 1, 1878.	Postage, expressage, and telegraphing	2,800 00	1,266 03	1,533 97	1,533 97
April 3, 1876.	Postage, expressage, and telegraphing, 29th fiscal year	612 45	239 36	373 09	373 09
April 1, 1878.	Contingent expenses	200 00	100 00	100 00	100 00
April 1, 1878.	Indexing Laws and Journals	450 00		450 00	450 00
	Total for Secretary of State's office				16,310 39
April 1, 1878.	Salary of Controller	\$8,000 00	\$4,000 00	\$4,000 00	\$4,000 00
April 1, 1878.	Salary of Deputy Controller	6,000 00	3,000 00	3,000 00	3,000 00
April 1, 1878.	Salary of Book-keeper	4,800 00	2,400 00	2,400 00	2,400 00
April 1, 1878.	Salaries of Clerks	14,400 00	7,200 00	7,200 00	7,200 00
April 1, 1878.	Pay of Porter	600 00	300 00	300 00	300 00
April 1, 1878.	Postage, expressage, and telegraphing	500 00	108 92	391 08	391 08
April 3, 1876.	Postage, expressage, etc., 29th fiscal year	726 33	2 10	724 23	724 23
April 1, 1878.	Contingent expenses	200 00	47 15	152 85	152 85
April 3, 1876.	Contingent expenses, 29th fiscal year	96 75	21 35	75 40	75 40
	Total for Controller's office				17,079 52
April 1, 1878.	Salary of Treasurer	\$8,000 00	\$4,000 00	\$4,000 00	\$4,000 00
April 1, 1878.	Salaries of Clerks	8,400 00	4,200 00	4,200 00	4,200 00
April 1, 1878.	Salaries of Watchmen	4,800 00	2,400 00	2,400 00	2,400 00
April 1, 1878.	Pay of Porter	300 00	150 00	150 00	150 00
April 1, 1878.	Postage and expressage	300 00		300 00	300 00
April 1, 1878.	Pasting and preserving coupons	600 00		600 00	600 00
	Total for State Treasurer's office				16,750 00
	Amount carried forward				\$895,945 39

EXPENDITURES FOR THE THIRTIETH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Amount of Appropriation for 30th and 31st Fiscal Years.	Amount Expended during 30th Fiscal Year.	Amount Unexpended at close of 30th Fiscal Year.	Total Expended during 30th Fiscal Year.
April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878----- April 3, 1876-----	Amount brought forward Salary of Attorney-General----- Salary of Clerk----- Pay of Porter----- Postage and expressage----- Costs and expenses of suits where the State is a party in interest----- Costs and expenses of suits, etc., 29th fiscal year-----	\$8,000 00 3,600 00 200 00 200 00 8,000 00 1,216 25	\$4,000 00 1,800 00 100 00 82 00 707 50 270 00	\$4,000 00 1,800 00 100 00 118 00 7,292 50 946 25	\$393,945 39 ----- ----- ----- ----- ----- -----
	Total for Attorney-General's office-----				6,959 50
April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878-----	Salary of Surveyor-General----- Salary of Deputy----- Salary of Clerk----- Pay of Porter----- Postage and expressage----- Purchase of maps----- Copying maps-----	\$4,000 00 4,800 00 3,600 00 600 00 250 00 400 00 300 00	\$2,000 00 2,400 00 1,800 00 300 00 114 60 400 00 300 00	\$2,000 00 2,400 00 1,800 00 300 00 135 40 400 00 300 00	----- ----- ----- ----- ----- ----- -----
	Total for Surveyor-General's office-----				6,614 60
April 1, 1878----- April 1, 1878----- April 1, 1878----- April 3, 1876-----	Salary of Register State Land Office----- Salaries of Clerks----- Postage and expressage----- Postage and expressage, 29th fiscal year-----	\$4,000 00 7,200 00 550 00 150 00	\$2,000 00 3,600 00 ----- 150 00	\$2,000 00 3,600 00 550 00 -----	----- ----- ----- -----
	Total for State Land Office-----				5,750 00
April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878----- April 1, 1878----- April 3, 1876-----	Salary of Superintendent Public Instruction----- Salary of Deputy----- Salary of Clerk----- Pay of Porter----- Postage and expressage----- Traveling expenses----- Traveling expenses, 29th fiscal year-----	\$6,000 00 3,600 00 3,000 00 400 00 1,000 00 3,000 00 789 00	\$3,000 00 3,600 00 1,500 00 200 00 575 51 691 85 162 00	\$3,000 00 1,800 00 1,500 00 200 00 1,024 49 2,308 15 627 00	----- ----- ----- ----- ----- ----- -----

April 1, 1878-----	Contingent expenses-----	209 00	68 70	131 30	-----
April 3, 1876-----	Contingent expenses, 29th fiscal year-----	78 93	78 93		
	Total for office Superintendent Public Instruction-----				8,076 99
April 1, 1878-----	Salary of Secretary State Board of Health-----	\$5,000 00	\$2,500 00	\$2,500 00	-----
April 1, 1878-----	Mileage and contingent expenses-----	2,000 00	605 90	1,394 10	-----
April 3, 1876-----	Mileage and contingent expenses, 29th fiscal year-----	1,614 85	193 00	1,421 85	-----
	Total for State Board of Health-----				3,298 90
April 1, 1878-----	Salaries of members State Board of Examiners-----	\$7,000 00	\$3,500 00	\$3,500 00	-----
April 1, 1878-----	Salary of Clerk Board of Examiners-----	2,400 00	1,200 00	1,200 00	-----
	Total for State Board of Examiners-----				4,700 00
April 1, 1878-----	Salary of State Librarian-----	\$6,000 00	\$3,000 00	\$3,000 00	-----
April 1, 1878-----	Salaries of Deputies-----	7,200 00	3,600 00	3,600 00	-----
April 1, 1878-----	Pay of Porter-----	1,800 00	900 00	900 00	-----
April 1, 1878-----	Postage and expressage-----	400 00	45 00	355 00	-----
April 3, 1876-----	Postage and expressage, 29th fiscal year-----	33 70	29 60	4 10	-----
May 17, 1861-----	Support of State Library (fees from Secretary of State)-----		11,357 89		-----
	Total for State Library-----				18,932 49
April 1, 1878-----	Salary of Superintendent State Printing-----	\$4,800 00	\$2,400 00	\$2,400 00	-----
April 1, 1878-----	Support of State Printing Office-----	100,000 00	50,033 58	49,966 42	-----
April 3, 1876-----	Support of State Printing Office, 29th fiscal year-----	315 84	315 00	84	-----
	Total for State Printing Office-----				52,748 58
April 1, 1878-----	Salary of Insurance Commissioner-----	\$6,000 00	\$3,000 00	\$3,000 00	-----
April 1, 1878-----	Salary of Clerk-----	3,600 00	1,800 00	1,800 00	-----
April 1, 1878-----	Rent and contingent expenses-----	5,000 00	2,123 59	2,876 41	-----
April 3, 1876-----	Rent and contingent expenses, 29th fiscal year-----	186 10	162 60	23 50	-----
	Total for Insurance Commissioner's office-----				7,086 19
	Amount carried forward-----				\$508,112 64

EXPENDITURES FOR THE THIRTIETH FISCAL YEAR--Continued.

Date of Act.	APPROPRIATION.	Amount of Appropriation for 30th and 31st Fiscal Years.	Amount Expended during 30th Fiscal Year.	Amount Unexpended at close of 30th Fiscal Year.	Total Expended during 30th Fiscal Year.
April 1, 1878.	Amount brought forward				\$508,112 64
April 1, 1878.	Salaries of Transportation Commissioners	\$18,000 00	\$4,000 00	\$14,000 00	
April 1, 1878.	Salary of Secretary	3,600 00	1,800 00	1,800 00	
April 1, 1878.	Contingent expenses	600 00	296 00	304 00	
	Total for Transportation Commissioner's office				6,096 00
July 31, 1878.	Received from Bank Commissioners to pay annual expenses				
	Salaries of Commissioners and Clerk, paid in 29th fiscal year.	\$13,913 60			
		1,091 65			
	Balance of appropriation for 30th fiscal year	\$12,821 95			
	Paid salaries of Bank Commissioners		\$8,250 00	\$336 57	
	Paid salary of Clerk		1,650 00		
	Paid rent of office		900 00		
	Paid safe and furniture		416 02		
	Paid stationery, fuel, etc.		213 56		
	Paid traveling expenses		1,055 80		
	Total for Bank Commissioners' office				12,485 38
April 1, 1878.	Pay of employes State Capitol building and grounds	\$28,800 00	\$14,400 00	\$14,400 00	
April 3, 1876.	Pay of employes State Capitol building, etc., 29th fiscal year	550 00	75 00	475 00	
April 1, 1878.	Permanent improvement of State Capitol grounds	20,400 00	18,821 75	1,178 25	
April 1, 1878.	Improvement of avenues and walks of State Capitol grounds	10,000 00	9,989 00	11 00	
April 1, 1878.	Irrigation, and purchase of hose and implements	3,000 00	1,234 64	1,765 36	
April 1, 1878.	Water used in the State Capitol	1,200 00	300 00	900 00	
April 1, 1878.	Repairs on State Capitol and furniture	1,000 00	300 00	500 00	
	Total for State Capitol building and grounds				45,320 39
April 1, 1878.	Aid to Southern California Horticultural Society, 29th fiscal year.	\$1,250 00	\$1,250 00		
April 1, 1878.	Aid to Southern California Horticultural Society, 30th fiscal year.	1,250 00	1,250 00		

March 18, 1878	State Agricultural Society	10,000 00	5,000 00	5,000 00	-----
March 18, 1878	Upper Sacramento Valley Agricultural Society	3,000 00	1,500 00	1,500 00	-----
March 18, 1878	San Joaquin Valley Agricultural Society	3,000 00	1,500 00	1,500 00	-----
March 18, 1878	Golden Gate District Fair Association	3,000 00	1,500 00	1,500 00	-----
March 18, 1878	Sonoma and Marin District Agricultural Society	3,000 00	1,500 00	1,500 00	-----
March 18, 1878	Northern District Agricultural Society	3,000 00	1,500 00	1,500 00	-----
March 18, 1878	Xapa and Solano District Agricultural Society	3,000 00	1,500 00	1,500 00	-----
March 18, 1878	Santa Clara Valley Agricultural Society	3,000 00	1,500 00	1,500 00	-----
March 18, 1878	Southern District Agricultural Society	3,000 00	1,500 00	1,500 00	-----
March 18, 1878	Plumas, Lassen, and Modoc District Fair	2,000 00	1,000 00	1,000 00	-----
March 18, 1878	Monterey County Agricultural Society	2,000 00	1,000 00	1,000 00	-----
March 18, 1878	El Dorado County Agricultural Society	2,000 00	1,000 00	1,000 00	-----
March 18, 1878	Siskiyou County Agricultural Society	2,000 00	949 50	1,050 50	-----
Total for Agricultural and Horticultural Societies					23,449 50
April 1, 1878	Aid to Magdalen Asylum, San Francisco	\$5,000 00	\$2,500 00	\$2,500 00	-----
April 1, 1878	San Francisco Female Hospital	6,000 00	3,000 00	3,000 00	-----
April 1, 1878	Protestant Episcopal Church Home	1,000 00	500 00	500 00	-----
April 1, 1878	Old Woman's Home, Rincon Hill, San Francisco	1,500 00	750 00	750 00	-----
April 1, 1878	Little Sisters' Infant Shelter	1,000 00	500 00	500 00	-----
April 1, 1878	Sisters of Mercy Hospital, Los Angeles	2,000 00	1,000 00	1,000 00	-----
April 1, 1878	Howard Benevolent Association, Sacramento	2,500 00	1,250 00	1,250 00	-----
April 1, 1878	Stockton Benevolent Association	1,000 00	500 00	500 00	-----
April 1, 1878	Marysville Benevolent Association	1,000 00	500 00	500 00	-----
April 1, 1878	Ladies' Benevolent Society, Placerville	1,000 00	500 00	500 00	-----
April 1, 1878	St. Luke's Hospital, San Francisco	1,500 00	750 00	750 00	-----
April 1, 1878	Scandinavian Ladies' Home	500 00	250 00	250 00	-----
April 1, 1878	Ladies' Relief Society, Sacramento	1,000 00	500 00	500 00	-----
April 1, 1878	Vallejo Ladies' Benevolent Society	1,000 00	500 00	500 00	-----
April 1, 1878	San José Ladies' Benevolent Society	2,000 00	1,000 00	1,000 00	-----
April 1, 1878	San Diego Ladies' Benevolent Society	1,000 00	500 00	500 00	-----
April 1, 1878	Pacific Dispensary for Women and Children	1,000 00	500 00	500 00	-----
April 1, 1878	Grass Valley Ladies' Relief Society	1,000 00	500 00	500 00	-----
April 1, 1878	Nevada Benevolent Society	1,000 00	500 00	500 00	-----
April 1, 1878	Ladies' Aid Society, Petaluma	1,000 00	500 00	500 00	-----
April 1, 1878	Board of State Prison Directors	2,500 00	1,250 00	1,250 00	-----
April 1, 1878	Ladies' Benevolent Society, Los Angeles	1,000 00	500 00	500 00	-----
April 1, 1878	Los Angeles Free Dispensary	300 00	150 00	150 00	-----
April 1, 1878	Youth's Directory, San Francisco	2,000 00	1,000 00	1,000 00	-----
Total special aid to charitable institutions					19,400 00
Amount carried forward					\$614,863 91

EXPENDITURES FOR THE THIRTIETH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Amount of Appropriation for 30th and 31st Fiscal Years	Amount Expended during 30th Fiscal Year.	Amount Unexpended at close of 30th Fiscal Year.	Total Expended during 30th Fiscal Year.
April 1, 1878. April 3, 1876.	Amount brought forward ----- Support of inmates of Orphan Asylums ----- Support of inmates of Orphan Asylums, 29th fiscal year ----- Support of inmates of Orphan Asylums, 28th fiscal year -----	----- ----- ----- -----	\$95,254 58 32,677 25 293 75	----- ----- ----- -----	\$614,863 91 ----- ----- -----
April 1, 1878. April 3, 1876.	Total for Orphan Asylums ----- Education and care of the deaf, dumb, and blind ----- Education and care of the deaf, dumb, and blind, 29th fiscal year -----	----- ----- \$72,000 00 6,000 00	----- ----- \$33,000 00 6,000 00	----- ----- \$39,000 00 -----	128,225 58 ----- ----- -----
April 1, 1878. April 1, 1878. April 1, 1878. April 3, 1876.	Total for deaf, dumb, and blind ----- Support of California Asylum for Insane, at Stockton ----- Support of Napa Branch Asylum for the Insane ----- Transportation of insane ----- Transportation of insane, 29th fiscal year -----	----- \$320,000 00 220,000 00 50,000 00 23,093 35	----- \$103,395 00 98,500 00 21,182 60 4,451 55	----- \$216,605 00 121,500 00 28,817 40 18,641 80	39,000 00 ----- ----- ----- -----
April 1, 1878. April 3, 1876.	Total for Insane Asylums ----- Support of State Prison ----- Support of State Prison, 29th fiscal year ----- Transportation of prisoners ----- Transportation of prisoners, 29th fiscal year -----	----- \$300,000 00 12,000 00 55,000 00 3,088 84	----- \$149,250 00 12,000 00 21,511 70 3,088 84	----- \$150,750 00 ----- 33,488 30 -----	227,529 15 ----- ----- ----- -----
April 1, 1878. April 3, 1876.	Total for State Prison ----- Official advertising ----- Official advertising, 29th fiscal year -----	----- \$5,000 00 878 25	----- \$1,295 10 861 00	----- \$3,704 90 17 25	185,850 54 ----- -----
April 1, 1878. April 3, 1876.	Total for official advertising ----- Stationery, fuel, lights, etc., for Legislature and State officers ----- Stationery, fuel, lights, etc., 29th fiscal year -----	----- \$25,000 00 114 31	----- \$11,239 56 114 24	----- \$13,760 44 07	2,156 10 ----- -----
	Total for stationery, fuel, lights, etc. -----	-----	-----	-----	11,353 80

April 1, 1878.	Traveling expenses of Surveyor-General and Attorney-General.	\$1,000 00		\$1,000 00	
April 3, 1876.	Traveling expenses of Surveyor-General and Attorney-General, 29th fiscal year.	215 00	205 00	10 00	
	Total for traveling expenses of Surveyor-General and Attorney-General.				205 00
March 26, 1872.	Support of State University (interest on bonds).		\$75,045 04		
March 30, 1878.	Construction of Mechanical Arts College building.		26,035 20		
April 1, 1878.	Furnishing and equipment of the Mining Arts College of the State University.	\$27,667 55		\$1,632 35	
April 1, 1878.	Furnishing and equipment of the Agricultural Department of the State University.	10,000 00	5,000 00	5,000 00	
April 1, 1878.	Payment of interest on \$100,000 to Hastings College of the Law.	10,000 00	5,000 00	5,000 00	
April 1, 1878.	Construction of Library and Art Gallery building on State University grounds.	14,000 00	5,250 00	8,750 00	
	Total for State University.	25,000 00		25,000 00	
April 1, 1878.	Support of State Normal School.	\$66,600 00	\$32,700 84	\$33,809 16	116,330 24
	Total for State Normal School.				32,790 84
April 1, 1878.	Services of State Board of Examination.	\$1,600 00	\$600 00	\$1,000 00	
April 3, 1876.	Services of State Board of Examination, 29th fiscal year.	300 00	150 00	150 00	
April 1, 1878.	Traveling expenses of State Board of Education.	500 00	250 00	250 00	
April 3, 1876.	Traveling expenses of State Board of Education, 29th fiscal year.	731 00	120 00	611 00	
	Total for State Educational Boards.				1,120 00
	<i>For Support of Schools.</i>				
Apportionments of August 7, 1878, and February 18, 1879.	Alameda County.		\$90,200 88		
	Alpine County.		720 72		
	Anaconda County.		18,426 87		
	Butte County.		27,512 10		
	Calaveras County.		15,476 70		
	Colusa County.		19,313 91		
	Contra Costa County.		22,813 56		
	Del Norte County.		3,473 94		
	El Dorado County.		16,275 59		
	Fresno County.		14,296 59		
	Amounts carried forward.		\$228,010 86		\$1,359,425 16

EXPENDITURES FOR THE THIRTIETH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Amount of Appropriation for 30th and 31st Fiscal Years.	Amount Expended during 30th Fiscal Year.	Amount Unexpended at close of 30th Fiscal Year.	Total Expended during 30th Fiscal Year.
Apportionments of August 7, 1878, and February 18, 1879-----	Amounts brought forward-----	-----	\$228,010 86	-----	\$1,359,425 16
	Humboldt County-----	-----	25,828 11	-----	-----
	Inyo County-----	-----	2,986 83	-----	-----
	Kern County-----	-----	8,475 59	-----	-----
	Lake County-----	-----	11,413 71	-----	-----
	Lassen County-----	-----	5,786 55	-----	-----
	Los Angeles County-----	-----	72,390 78	-----	-----
	Marin County-----	-----	13,520 43	-----	-----
	Mariposa County-----	-----	6,347 88	-----	-----
	Mendocino County-----	-----	23,825 34	-----	-----
	Merced County-----	-----	8,128 89	-----	-----
	Modoc County-----	-----	6,846 84	-----	-----
	Mono County-----	-----	1,628 55	-----	-----
	Monterey County-----	-----	22,862 07	-----	-----
	Napa County-----	-----	21,760 20	-----	-----
	Nevada County-----	-----	34,989 57	-----	-----
	Placer County-----	-----	2,867 39	\$16,806 88	-----
	Plumas County-----	-----	6,943 86	-----	-----
	Sacramento County-----	-----	48,572 37	-----	-----
	San Benito County-----	-----	10,727 64	-----	-----
	San Bernardino County-----	-----	16,777 53	-----	-----
	San Diego County-----	-----	11,649 33	-----	-----
	San Francisco County-----	-----	387,380 07	-----	-----
	San Joaquin County-----	-----	36,749 79	-----	-----
	San Luis Obispo County-----	-----	18,191 25	-----	-----
	San Mateo County-----	-----	16,742 88	-----	-----
	Santa Barbara County-----	-----	19,695 06	-----	-----
	Santa Clara County-----	-----	65,876 58	-----	-----
	Santa Cruz County-----	-----	25,668 72	-----	-----
	Shasta County-----	-----	12,485 78	-----	-----
	Sierra County-----	-----	8,198 19	-----	-----
	Siskiyou County-----	-----	13,139 28	-----	-----
	Solano County-----	-----	31,614 66	-----	-----
	Sonoma County-----	-----	52,189 83	-----	-----

Stanislaus County-----	11,739 42		
Sutter County-----	11,171 16		
Tehama County-----	13,700 61		
Trinity County-----	4,857 93		
Tulare County-----	23,334 28		
Tuolumne County-----	12,315 38		
Ventura County-----	9,999 99		
Yolo County-----	20,970 18		
Yuba County-----	17,373 51		
	\$1,407,134 87	\$10,806 88	
Sierra County, 29th fiscal year-----	7,445 60		
Siskiyou County, 29th fiscal year-----	12,122 88		
Total for support of schools-----			1,425,703 35
Purchase of bonds for School Fund-----			
	\$97,364 28		
Total for purchase of bonds for School Fund-----			97,364 28
Annulment of certificates of purchase-----			
Restitution of money for lands sold not property of the State-----	\$1,029 28		
Services of Registers and Receivers of United States Land Offices-----	6,408 21		
Services of Registers and Receivers of United States Land Offices, 29th fiscal year-----	\$3,000 00	\$3,000 00	
Procuring and listing lands to the State by the United States, deficiency for 24th and 25th fiscal years-----	5,882 00	5,882 00	
	9,448 00	7,836 00	
Total for lands-----			9,079 49
Payment of interest on Soldiers' Relief bonds-----			
Payment of interest on Pacific Railroad bonds-----	\$6,685 00		
Payment of interest on State Capital bonds of 1870-----	105,000 00		
Payment of interest on State Capital bonds of 1872-----	17,500 00		
Payment of interest on civil bonds of 1873-----	17,500 00		
	168,060 00		
Total annual interest on bonds-----			344,745 00
Amount carried forward-----			\$3,207,317 28

Apportionment
of Feb. 16, 1878

Act of March 28,
1868

March 28, 1868

April 4, 1870

April 1, 1878

April 3, 1876

April 1, 1878

April 27, 1863

April 4, 1864

April 4, 1870

March 28, 1872

April 2, 1870

EXPENDITURES FOR THE THIRTIETH FISCAL YEAR—Continued.

Date of Act.	APPROPRIATION.	Amount of Appropriation for 30th and 31st Fiscal Years.	Amount Expended during 30th Fiscal Year.	Amount Unexpended at close of 30th Fiscal Year.	Total Expended during 30th Fiscal Year.
March 25, 1874	Amount brought forward				\$3,207,317 28
Feb. 20, 1872	Payment of interest on Levee District No. 5 bonds, Sutter County		\$16,780 00		16,780 00
	Payment of canceled warrants		223 16		223 16
April 1, 1878	Salary of Adjutant-General	\$6,000 00	3,000 00	\$3,000 00	
April 1, 1878	Salary of Assistant Adjutant-General	4,000 00	2,000 00	2,000 00	
April 1, 1878	Pay of Porter	600 00	300 00	300 00	
April 1, 1878	Postage and expressage.	200 00	73 67	126 33	
April 1, 1878	Cleaning and transportation of arms, traveling and contingent expenses	1,500 00	403 94	1,096 06	
April 3, 1876	Cleaning and transportation of arms, 29th fiscal year	636 55	267 75	368 80	
April 1, 1878	Payment of Armory rents, etc., National Guard of California	90,328 00	41,672 00	48,656 00	
April 3, 1876	Payment of Armory rents, etc., 29th fiscal year	12,066 00	12,030 35	35 65	
March 30, 1878	Conservation of the public peace	20,000 00	1,421 00	18,579 00	
	Total for military purposes				61,168 71
	Estate of J. L. Folsom, deceased		\$581 88	\$553 07	
	Estate of Patrick Shiarvin, deceased		1,999 69		
	Estate of John Myers, deceased		82 50	742 50	
	Total from estates of deceased persons				2,664 07
Feb. 28, 1876	Improvement of wharves, docks, etc., in San Francisco		\$241,764 39		
	Total for San Francisco Harbor improvements				241,764 39
	<i>Miscellaneous.</i>				
April 1, 1878	Arresting criminals without the limits of the State	\$5,000 00	\$1,690 20	\$3,309 80	
April 3, 1876,					
Feb. 21, and					
April 1, 1878	Arresting criminals without the limits of the State, 29th fiscal year, balance	4,328 05	4,038 31	489 74	
April 1, 1878	Payment of rewards offered by the Governor	4,000 00	1,300 00	2,700 00	
April 3, 1876	Payment of rewards offered by the Governor, 29th fiscal year	1,400 00	300 00	1,100 00	

April 1, 1878----	Payment of rewards for arrest of highway robbers-----	12,000 00	600 00	11,400 00	-----
April 3, 1876----	Payment of rewards for arrest of highway robbers, 29th fiscal year-----	900 00	900 00	-----	-----
April 1, 1878----	Payment of claim of Denis Jordan-----	6,617 00	4,705 46	1,911 54	-----
April 1, 1878----	Restoration and preservation of fish-----	10,000 00	5,000 00	5,000 00	-----
April 1, 1878----	Purchase of Supreme Court Reports-----	5,400 00	-----	5,400 00	-----
April 1, 1878----	Purchase of ballot paper-----	10,000 00	-----	10,000 00	-----
April 1, 1878----	Translating into Spanish laws of the 22d Session of the Legislature-----	1,500 00	1,491 20	8 80	-----
March 29, 1878----	Expenses to provide a system of irrigation, drainage, navigation, etc.-----	97,002 84	67,427 94	29,574 90	-----
April 1, 1878----	Expenses of preliminary survey of Sacramento River Drainage District-----	10,000 00	9,913 67	86 33	-----
April 1, 1878----	Completion of Branch State Prison, at Folsom-----	204,194 73	53,883 39	150,311 34	-----
March 13, 1878----	Support and maintenance of Training-ship in San Francisco, per annum-----	25,000 00	21,676 85	3,323 15	-----
April 1, 1878----	Improvement and preservation of Yosemite Valley and Mariposa Big Tree Grove-----	10,000 00	7,777 00	2,223 00	-----
	Total for miscellaneous purposes-----			180,704 02	-----
	Total expenditures from all sources-----			\$3,710,621 63	-----
	Deduct amount paid for interest on State bonds, held in trust by State Treasurer, \$166,260, as this amount is included twice in expenditures, to wit, in the payment of interest on bonds, and in the support of common schools and State University-----			166,260 00	-----
	Making the total actual expenditures-----			\$3,544,361 63	-----

RECAPITULATION

Of Expenditures for the 30th fiscal year.

FOR WHAT PURPOSE EXPENDED.	Amount.
Constitutional Convention.....	\$150,000 00
Judicial Department.....	184,923 05
Governor's office.....	14,882 43
Secretary of State's office.....	16,310 39
Controller's office.....	17,079 52
Treasurer's office.....	10,750 00
Attorney-General's office.....	6,959 50
Surveyor-General's office.....	6,614 60
Register State Land Office.....	5,750 00
Superintendent of Public Instruction's office.....	8,076 99
State Board of Health.....	3,298 90
State Board of Examiners.....	4,700 00
State Library.....	18,932 49
State Printing Office.....	52,748 58
Insurance Commissioner's office.....	7,086 19
Transportation Commissioner's office.....	6,096 00
Bank Commissioners' office.....	12,485 38
Capitol building and grounds.....	45,320 39
Agricultural and Horticultural Societies.....	23,449 50
Charitable institutions.....	19,400 00
Orphan Asylums.....	128,225 58
Deaf, Dumb, and Blind Institution.....	39,000 00
Insane Asylums and transportation of insane.....	227,529 15
State Prison, San Quentin, and transportation of prisoners.....	185,850 54
Official advertising.....	2,156 10
Stationery, fuel, lights, etc., for members of Legislature and State officers.....	11,353 80
Traveling expenses of Surveyor-General and Attorney-General.....	205 00
State University.....	116,330 24
State Normal School.....	32,790 84
State Educational Boards.....	1,120 00
Support of schools.....	1,426,703 35
Purchase of bonds for School Fund.....	97,364 28
Lands.....	9,079 49
Payment of interest on bonds of the State of California.....	\$314,745 00
Less interest on bonds held in trust by State Treasurer and paid into School and University Funds.....	166,260 00
	148,485 00
Payment of interest on Levee District No. 5 bonds, Sutter County.....	16,780 00
Payment of canceled warrants.....	223 16
Military purposes.....	61,168 71
Estates of deceased persons.....	2,664 07
Improvement of wharves, docks, etc., in San Francisco.....	241,764 39
Miscellaneous purposes, as per preceding page.....	180,704 02
Total.....	\$3,544,361 63

BALANCE SHEET

SHOWING

The Condition of the Several Funds for the 29th and 30th Fiscal Years.

STATEMENT No. 5.

Showing the condition of the several funds for the 29th and 30th fiscal years.

Dr.	GENERAL FUND.		Cr.
March 14, 1878—To transfer to Folsom Branch State Prison Fund-----		July 1, 1877—By balance-----	\$330,388 74
June 29, 1878—To warrants issued-----	\$85,194 73	September 15, 1877—By transfer from Folsom Branch State Prison Fund-----	85,194 73
June 29, 1878—To balance-----	1,740,635 12	March 20, 1878—By transfer from Insane Asylum Special Fund, to close account-----	24,474 25
	408,202 26	March 20, 1878—By transfer from Capitol Fund, to close account-----	150 75
		March 20, 1878—By transfer from Military Fund, to close account-----	109 37
		March 20, 1878—By transfer from State Normal School Building Fund, to close account-----	10 24
		June 29, 1878—By warrants canceled-----	38 50
		June 29, 1878—By receipts-----	1,793,665 53
	<u>\$2,234,032 11</u>		<u>\$2,234,032 11</u>
February 11, 1879—To transfer to Interest and Sinking Fund-----	\$88,000 00	July 1, 1878—By balance-----	\$408,202 26
February 11, 1879—To transfer to San Francisco Harbor Improvement Fund-----	300,000 00	October 24, 1878—By transfer from Interest and Sinking Fund-----	88,000 00
February 11, 1879—To transfer to Folsom Branch State Prison Fund-----	50,000 00	November 9, 1878—By transfer from San Francisco Harbor Improvement Fund-----	300,000 00
June 30, 1879—To warrants issued-----	1,461,246 87	January 10, 1879—By transfer from Folsom Branch State Prison Fund-----	50,000 00
June 30, 1879—To balance-----	384,669 74	June 30, 1879—By warrants canceled-----	107 00
		June 30, 1879—By receipts-----	1,437,607 35
	<u>\$2,283,916 61</u>		<u>\$2,283,916 61</u>
		July 1, 1879—By balance-----	\$384,669 74

Dr.

SCHOOL FUND.

Cr.

June 29, 1878—To warrants issued to County Treasurers -----	\$1,571,485 89	July 1, 1877—By balance -----	\$220,049 95
June 29, 1878—To balance -----	164,604 18	July 10, 1877—By sale of Geological Survey Reports -----	90 40
		June 29, 1878—By interest on bonds -----	121,591 50
		June 29, 1878—By receipts from counties -----	1,394,358 22
	<u>\$1,736,090 07</u>		<u>\$1,736,090 07</u>
June 30, 1879—To warrants issued -----	\$1,426,703 35	July 1, 1878—By balance -----	\$164,604 18
June 30, 1879—To balance -----	190,280 24	June 30, 1879—By sale of Geological Survey Reports -----	310 25
		June 30, 1879—By interest on bonds -----	124,894 70
		June 30, 1879—By receipts from counties -----	1,327,174 46
	<u>\$1,616,983 59</u>		<u>\$1,616,983 59</u>
		July 1, 1879—By balance -----	\$190,280 24

Dr.

INTEREST AND SINKING FUND.

Cr.

June 29, 1878—To warrants issued for redemption of bonds and accrued interest -----	\$8,252 73	July 1, 1877—By balance -----	\$240,311 07
June 29, 1878—To warrants issued for interest on State bonds -----	314,745 00	June 29, 1878—By receipts from counties -----	310,801 85
June 29, 1878—To balance -----	257,115 19		
	<u>\$560,112 92</u>		<u>\$560,112 92</u>
October 24, 1878—To transfer to General Fund -----	\$88,000 00	July 1, 1878—By balance -----	\$237,115 19
June 30, 1879—To warrants issued for interest on State bonds -----	314,745 00	February 11, 1879—By transfer from General Fund -----	88,000 00
June 30, 1879—To balance -----	253,758 97	June 30, 1879—By receipts from counties -----	331,388 78
	<u>\$656,503 97</u>		<u>\$656,503 97</u>
		July 1, 1879—By balance -----	\$553,758 97

Dr.

STATE SCHOOL LAND FUND.

Cr.

June 29, 1878—To warrants issued -----		July 1, 1877—By balance -----	\$68,064 16
June 29, 1878—To balance -----	\$80,515 42	June 29, 1878—By warrants canceled -----	804 95
	69,194 70	June 29, 1878—By receipts from counties -----	80,841 01
	<u>\$149,710 12</u>		<u>\$149,710 12</u>
June 30, 1879—To warrants issued -----		July 1, 1878—By balance -----	\$69,194 70
June 30, 1879—To balance -----	\$105,024 93	June 30, 1879—By receipts from counties -----	73,383 14
	37,352 91		
	<u>\$142,577 84</u>		<u>\$142,577 84</u>
		July 1, 1879—By balance -----	\$37,552 91

Dr.

STATE CAPITOL FUND.

Cr.

February 11, 1878—To warrants issued -----		July 1, 1877—By balance -----	\$267 10
March 20, 1878—To transfer to General Fund, to close account. -----	\$342 35	August 2, 1877—By rent of Capitol grounds -----	226 00
	150 75		
	<u>\$493 10</u>		<u>\$493 10</u>

Dr.

MILITARY FUND.

Cr.

March 20, 1878—To transfer to General Fund, to close account. -----	\$109 37	July 1, 1877—By balance -----	\$109 37
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Dr.

INSANE ASYLUM SPECIAL FUND.

Cr.

March 20, 1878—To transfer to General Fund, to close account. -----	\$24,474 25	July 1, 1877—By balance -----	\$24,474 25
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STATE NORMAL SCHOOL BUILDING FUND.

Dr.

Cr.

March 30, 1878.—To transfer to General Fund, to close account.	\$10 24	July 1, 1877—By balance	\$10 24
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Dr.

Cr.

CONDEMNATION FUND.

June 30, 1878.—To balance	\$8,000 00	April 20, 1878—By Clerk of Contra Costa County	\$8,000 00
	\$8,000 00		\$8,000 00
June 30, 1879.—To balance	\$9,023 00	July 1, 1878—By balance	\$8,000 00
	\$9,023 00	March 8, 1879—By Clerk of Napa County	1,023 00
		July 1, 1879—By balance	\$9,023 00
			\$9,023 00

Dr.

Cr.

UNIVERSITY FUND.

June 29, 1878.—To warrants issued	\$50,617 27	July 1, 1877—By balance	\$577 27
	\$50,617 27	June 29, 1878—By interest on bonds	50,040 00
June 30, 1879.—To warrants issued	\$75,045 04	June 30, 1879—By interest on bonds	\$50,617 27
			\$75,045 04

Dr.

Cr.

UNIVERSITY ENDOWMENT FUND.

July 5, 1877.—To warrants issued	\$627 20	July 1, 1877—By balance	\$627 20
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STATE LIBRARY FUND.

Cr.

Dr.

June 30, 1878—To warrants issued -----	\$5,287 63	July 1, 1877—By balance -----	\$1,341 08
June 29, 1878—To balance -----	7,685 45	June 29, 1878—By fees from office of Secretary of State -----	11,652 00
	<u>\$12,973 08</u>		<u>\$12,973 08</u>
June 30, 1879—To warrants issued -----	\$11,357 89	July 1, 1878—By balance -----	\$7,685 45
June 30, 1879—To balance -----	7,181 31	June 30, 1879—By fees from office of Secretary of State -----	10,853 75
	<u>\$18,539 20</u>		<u>\$18,539 20</u>
		July 1, 1879—By balance -----	<u>\$7,181 31</u>

SUPREME COURT LIBRARY FUND.

Cr.

Dr.

June 29, 1878—To warrants issued -----	\$2,274 10	July 1, 1877—By balance -----	\$3,127 40
June 29, 1878—To balance -----	2,139 56	June 29, 1878—By fees from Clerk of Supreme Court -----	1,286 26
	<u>\$4,413 66</u>		<u>\$4,413 66</u>
June 30, 1879—To warrants issued -----	\$1,513 70	July 1, 1878—By balance -----	\$2,139 56
June 30, 1879—To balance -----	2,627 59	June 30, 1879—By fees from Clerk of Supreme Court -----	2,001 73
	<u>\$4,141 29</u>		<u>\$4,141 29</u>
		July 1, 1879—By balance -----	<u>\$2,627 59</u>

WAR BOND FUND.

Dr.

Cr.

June 29, 1878—To balance -----		July 1, 1877—By balance -----	
	\$8,595 76		\$8,595 76
	<u>\$8,595 76</u>		<u>\$8,595 76</u>
June 30, 1879—To balance -----		July 1, 1878—By balance -----	
	\$8,595 76		\$8,595 76
	<u>\$8,595 76</u>		<u>\$8,595 76</u>
		July 1, 1879—By balance -----	
			\$8,595 76

FOLSOM BRANCH STATE PRISON FUND.

Dr.

Cr.

September 15, 1877—To transfer to General Fund -----		July 1, 1877—By balance -----	
March 14, 1878—To warrant issued to John A. Odell -----		March 14, 1878—By transfer from General Fund -----	
June 29, 1878—To balance -----			\$85,494 73
	\$85,194 73		<u>\$85,194 73</u>
	<u>1,300 00</u>		
	84,194 73		
	<u>\$170,689 46</u>		<u>\$170,689 46</u>
January 10, 1879—To transfer to General Fund -----		July 1, 1878—By balance -----	
June 30, 1879—To warrants issued -----		February 11, 1879—By transfer from General Fund -----	
June 30, 1879—To balance -----			\$84,194 73
	\$50,000 00		<u>50,000 00</u>
	<u>53,883 39</u>		
	30,311 34		
	<u>\$134,194 73</u>		<u>\$134,194 73</u>
		July 1, 1879—By balance -----	
			\$30,311 34

SAN FRANCISCO HARBOR IMPROVEMENT FUND.

Cr.

Dr.

June 29, 1878—To warrants issued.....	\$170,712 80	July 1, 1877—By balance.....	\$317,226 81
June 29, 1878—To balance	430,859 07	June 29, 1878—By receipts from State Harbor Commissioners.....	284,345 06
	<u>\$601,571 87</u>		<u>\$601,571 87</u>
November 9, 1878—To transfer to General Fund.....	\$300,000 00	July 1, 1878—By balance	\$430,859 07
June 30, 1879—To warrants issued.....	241,764 39	February 11, 1879—By transfer from General Fund.....	300,000 00
June 30, 1879—To balance	470,626 11	June 30, 1879—By receipts from State Harbor Commissioners.....	281,531 43
	<u>\$1,012,390 50</u>		<u>\$1,012,390 50</u>
		July 1, 1879—By balance	<u>\$470,626 11</u>

ESTATES OF DECEASED PERSONS FUND.

Cr.

Dr.

April 17, 1878—To warrant issued to Main & Winchester, from estate of J. L. Folsom, deceased.....	\$29 31	July 1, 1877—By balance.....	\$15,254 84
May 21, 1878—To warrants issued (counsel fees).....	155 71	June 29, 1878—By receipts, sundry estates.....	3,126 82
June 29, 1878—To balance	18,196 64		
	<u>\$18,381 66</u>		<u>\$18,381 66</u>
August 1, 1878—To warrant issued to James Fitton, from estate of J. L. Folsom, deceased.....	\$581 88	July 1, 1878—By balance	\$18,196 64
September 5, 1878—To warrants issued to heirs of Patrick Sharvin, deceased, and County Clerk's fee.....	1,999 69	June 30, 1879—By receipts, sundry estates.....	919 19
February 13, 1879—To warrant issued for attorney's fee from estate of John Myers, deceased.....	82 50		
June 30, 1879—To balance.....	16,451 76		<u>\$19,115 83</u>
	<u>\$19,115 83</u>	July 1, 1879—By balance.....	<u>\$16,451 76</u>

ELECTION REWARD FUND.

Dr.

Cr.

June 29, 1878—To balance -----	\$1,615 79	July 1, 1877—By balance -----	\$1,201 21
		June 29, 1878—By receipts from Secretary of State -----	414 58
	\$1,615 79		
			\$1,615 79
June 30, 1879—To balance -----	\$1,677 42	July 1, 1878—By balance -----	\$1,615 97
		June 30, 1879—By receipts from Secretary of State -----	61 63
	\$1,677 42		
			\$1,677 42
		July 1, 1879—By balance -----	\$1,677 42

INTEREST AND SINKING FUND, LEVEE DISTRICT No. 5.

Dr.

Cr.

June 29, 1878—To warrant issued -----	\$6,300 00	July 1, 1877—By balance -----	\$15 65
June 29, 1878—To balance -----	15 65	June 29, 1878—By receipts from Sutter County -----	6,300 00
	\$6,315 65		
			\$6,315 65
January 29, 1879—To warrant issued -----	\$16,780 00	July 1, 1878—By balance -----	\$15 65
June 30, 1879—To balance -----	23 09	January 28, 1879—By receipts from Sutter County -----	16,787 44
	\$16,803 09		
			\$16,803 09
		July 1, 1879—By balance -----	\$23 09

SWAMP LAND DISTRICT No. 1 FUND.

Dr.

Cr.

July 31, 1877—To warrants and interest paid by State Treasurer-----			
June 29, 1878—To balance -----	\$2,170 18 443 03	July 1, 1877—By balance -----	\$2,613 21
	<u>\$2,613 21</u>		<u>\$2,613 21</u>
June 30, 1879—To balance -----	\$443 03	July 1, 1878—By balance -----	\$443 03
	<u>\$443 03</u>		<u>\$443 03</u>
		July 1, 1879—By balance -----	\$443 03

SWAMP LAND DISTRICT No. 2 FUND.

Dr.

Cr.

July 31, 1877—To warrants and interest paid by State Treasurer-----			
June 29, 1878—To balance -----	\$213 97 883 30	July 1, 1877—By balance -----	\$1,097 27
	<u>\$1,097 27</u>		<u>\$1,097 27</u>
June 30, 1879—To balance -----	\$883 30	July 1, 1878—By balance -----	\$883 30
	<u>\$883 30</u>		<u>\$883 30</u>
		July 1, 1879—By balance -----	\$883 30

SWAMP LAND DISTRICT No. 18 FUND.

Dr.

Cr.

October 25, 1877—To \$4,600 in warrants redeemed by State Treasurer for-----	\$4,575 22	July 1, 1877—By balance in State treasury-----	\$534 72
June 29, 1878—To balance-----	534 72	October 25, 1877—By receipts from Yolo County-----	4,575 22
	<u>\$5,109 94</u>		<u>\$5,109 94</u>
June 30, 1879—To \$26,945 57 in warrants and interest, redeemed by State Treasurer for-----	\$26,888 88	July 1, 1878—By balance in State treasury-----	\$534 72
June 30, 1879—To balance-----	534 72	January 28, 1879—By receipts from Yolo County, in Controller's warrants and interest-----	19,740 64
		January 30, 1879—By receipts from Solano County, in Controller's warrants and interest-----	4,508 12
		May 19, 1879—By receipts from Yolo County, in Controller's warrants and interest-----	2,640 12
	<u>\$27,423 60</u>		<u>\$27,423 60</u>
		July 1, 1879—By balance in State treasury-----	\$534 72

STATEMENT NO. 6.

Showing the balances in the several funds, amount of warrants outstanding, and balances in the State treasury, June 30th, 1879.

FUNDS.	Balance in Fund.	Warrants Out- standing.	Balance in State Treasury.
General Fund -----	\$384,669 74	\$75,653 73	\$460,323 47
School Fund -----	190,280 24		190,280 24
Interest and Sinking Fund -----	253,758 97		253,758 97
State School Land Fund -----	37,552 91	331 12	37,884 03
State Library Fund -----	7,181 31	585 00	7,766 31
Condemnation Fund -----	9,023 00		9,023 00
Supreme Court Library Fund -----	2,627 59		2,627 59
Folsom Branch State Prison Fund -----	30,311 34	6,100 40	36,411 74
San Francisco Harbor Improvement Fund -----	470,626 11	500 00	471,126 11
War Bond Fund -----	8,595 76		8,595 76
Estates of deceased persons -----	16,451 76		16,451 76
Election Reward Fund -----	1,677 42		1,677 42
Interest and Sinking Fund, Levee District No. 5, Sutter County -----	23 09		23 09
Swamp Land District No. 1 -----	443 03		443 03
Swamp Land District No. 2 -----	883 30		883 30
Swamp Land District No. 5 -----	173 32		173 32
Swamp Land District No. 17 -----	8 00		8 00
Swamp Land District No. 18 -----	534 72		534 72
Swamp Land District No. 41 -----	44		44
Swamp Land District No. 45 -----	9 85		9 85
Swamp Land District No. 46 -----	5 24		5 24
Swamp Land District No. 49 -----	18 70		18 70
Swamp Land District No. 51 -----	34 08		34 08
Swamp Land District No. 59 -----	390 38		390 38
Totals -----	\$1,415,280 30	\$83,170 25	\$1,498,450 55

FINANCIAL CONDITION
OF
THE SEVERAL COUNTIES OF THE STATE
FOR
THE YEARS 1877-8 AND 1878-9.

STATEMENT No. 7.

Financial condition of the several counties for the year 1877-8.

COUNTIES.	Funded Debt.	Floating Debt.	Rates of Interest.	Value of Property owned by County.	Cash in hands of County Treasurer.	Total Value of Property.	Rate of Taxation on each \$100.			Amount of State and County Taxes.
							State.	County.	Total.	
Alameda	\$246,944 00	\$61,061 00	7, 8, 10	\$201,000 00	\$104,790 14	\$41,606,894 00	63	{ 37 62	\$ 1 00 1 25	\$461,534 58
Alpine	22,430 00	22,430 00	6, 7, 10	1,500 00	3,720 00	568,174 00	63	\$2 10	2 73	15,511 15
Anamor	82,075 12	82,075 12	7, 10	35,000 00	13,634 43	2,541,408 00	63	1 87	2 50	63,535 20
Butte*	104,587 35	104,587 35	10	126,000 00	38,378 42	10,501,554 00	63	1 37	2 00	210,031 08
Calaveras	102,300 00	68,755 61	8, 10	20,000 00	3,637 84	1,982,497 00	63	2 47	3 10	61,457 40
Colusa	32,500 00	750 00	7, 10	30,000 00	47,668 13	11,336,536 00	63	1 02	1 65	187,032 83
Contra Costa	56,018 70	56,018 70	7	35,000 00	27,984 37	7,036,952 00	63	97	1 60	112,591 23
Del Norte	6,610 74	6,610 74	7	7,000 00	4,345 48	667,693 00	63	1 37	2 00	13,353 86
El Dorado	155,500 00	5,306 11	7, 10	25,000 00	11,927 17	2,327,470 00	63	1 60	2 23	51,902 58
Fresno	40,500 00	272 22	10	71,000 00	9,391 18	6,073,367 00	63	1 32	1 95	118,430 65
Humboldt	118,440 94	118,440 94	7, 9	12,000 00	62,587 13	5,118,757 00	63	1 67	2 30	115,172 03
Inyo	32,500 00	60,798 84	7, 10	40,500 00	9,438 42	1,735,298 00	63	2 37	3 00	52,058 94
Kern	65,000 00	15,279 55	7, 10	45,300 00	17,613 28	5,513,925 00	63	1 56	2 19	120,754 97
Lake	61,400 00	23,419 01	8, 7, 12	73,038 00	9,717 30	2,156,461 00	63	1 92	2 55	54,989 75
Lassen	10,735 38	12,259 97	10	10,000 00	6,255 00	1,232,776 00	63	2 12	2 75	33,901 34
Los Angeles	638,550 00	57,163 59	7, 10	60,000 00	34,651 98	15,790,040 00	63	{ 1 04 1 27	1 67 1 90	286,788 19
Marin	300,000 00	23,474 09	7, 8, 10	95,000 00	21,282 89	7,963,570 00	63	97	1 60	127,417 12
Mariposa	44,753 87	44,753 87	7	22,000 00	4,777 73	1,467,216 00	63	2 32	2 95	43,282 87
Mendocino	132,498 00	25,731 28	7, 8, 9, 10	53,250 00	33,093 85	6,006,992 00	63	1 37	2 00	120,139 84
Merced	75,000 00	59,753 43	7, 10	106,000 00	18,587 01	5,034,118 00	63	1 27	1 90	95,648 24
Modoc	14,326 31	2,152 23	7, 10	2,536 00	9,567 01	1,090,938 00	63	1 57	2 20	24,000 63
Mono			7	3,300 00	5,618 00	617,330 00	63	1 51.5	2 14.5	13,889 80
Monterey		43,662 92	7	10,000 00	31,090 27	7,252,802 00	63	87	1 50	108,792 03
Napa	228,000 00	97,077 06	7, 10	240,000 00		7,906,589 00	63	1 27	1 90	151,935 19
Nevada		39,910 07	7	90,000 00	19,082 60	7,033,198 00	63	1 27	1 90	133,630 75
Placer				19,500 00	22,075 96	5,835,725 00	63	87	1 50	87,535 87
Plumas	56,850 00	23,295 64	7, 10	26,500 00	14,553 50	2,040,966 00	63	1 87	2 50	51,024 15
Sacramento	705,052 00		6, 8	332,250 00	34,978 69	17,986,500 00	63	87	1 50	269,797 50

San Benito-----	11,000 00	7,416 57	7, 10	14,600 00	9,843 52	3,816,238 00	63	{ 87	1 50	57,243 57
San Bernardino-----		24,131 04	7, 8	47,800 00	10,719 90	2,408,385 00	63	{ 2 20	2 20	58,270 30
San Diego-----	96,346 82	79,658 19	7, 10	60,250 00	21,082 67	4,167,188 00	63	{ 1 87	2 50	99,179 07
San Francisco †-----	4,322,500 00		6, 7	11,435,000 00	399,548 28	254,865,810 00	63	{ 1 75	2 38	46,664,044 82
San Joaquin-----	310,300 00		7, 8, 10	138,000 00	87,590 37	17,276,722 00	63	{ 1 20	1 83	241,873 58
San Luis Obispo-----	147,000 00	12,108 45	7, 8, 10	40,000 00	5,160 28	4,143,910 00	63	{ 87	1 50	62,188 63
San Mateo-----	90,000 00		10	28,000 00	17,327 73	6,510,576 00	63	{ 1 17	1 80	117,190 28
Santa Barbara-----	70,000 00		7, 10	76,000 00	22,528 57	4,187,175 00	63	{ 1 22	1 85	77,462 73
Santa Clara-----	387,000 00	180,328 98	7, 8	336,000 00	24,474 41	27,990,450 00	63	{ 97	1 60	447,847 20
Santa Cruz-----	208,700 00	39,138 95	7, 8, 10	63,000 00	29,602 92	6,508,791 00	63	{ 1 37	2 00	130,175 81
Shasta-----		77,425 09	7	19,600 00	10,778 30	1,953,579 00	63	{ 1 87	2 50	48,839 47
Sierra-----	22,275 00	5,623 47	10	11,000 00	20,189 32	1,619,687 00	63	{ 1 97	2 60	42,111 85
Siskiyou-----	55,600 00		10	17,500 00	11,874 76	2,638,036 00	63	{ 1 17	1 80	47,481 64
Solano-----	132,310 00		7	31,000 00	17,761 01	9,022,101 00	63	{ 1 47	2 10	189,464 12
Sonoma-----	374,700 00	129,066 83	7, 8	239,000 00	40,736 26	15,548,664 00	63	{ 92	1 55	241,004 29
Stanislaus-----	36,000 00		7	43,000 00	14,382 35	5,425,116 00	63	{ 1 02	1 65	89,514 41
Sutter-----	25,000 00	35,000 00	7, 10	51,500 00	19,963 43	3,988,124 00	63	{ 1 17	1 80	71,786 22
Tehama-----	67,000 00	29,155 43	7, 8, 10	30,200 00	22,751 69	3,839,461 00	63	{ 1 57	2 20	84,468 14
Trinity-----		65,853 11	7, 10	7,500 00	13,374 25	804,657 00	63	{ 2 12	2 75	92,128 07
Tulare-----	75,000 00	74,443 80	7, 10	84,500 00	14,111 67	4,806,470 00	63	{ 1 52	2 15	103,339 10
Tuolumne-----		38,825 84	7	18,000 00	596 44	1,633,550 00	63	{ 2 02	2 65	43,819 07
Ventura-----	20,000 00		10	22,000 00	19,331 00	3,036,196 00	63	{ 1 22	1 85	54,651 53
Yolo-----		105,581 40	7	40,000 00	5,195 65	9,932,975 00	63	{ 1 02	1 65	163,894 08
Yuba-----	186,500 00	7,800 00	7, 8	65,000 00	20,497 08	4,291,415 00	63	{ 1 87	2 50	114,602 84
Totals-----	\$9,719,474 86	\$1,936,049 41	-----	\$14,841,124 00	\$1,479,869 64	\$586,953,022 00	-----	{ 2 17	2 80	\$10,458,743 11

* To credit of funded debt, \$2,835 10.

† To credit of funded debt, \$755,386 46.

STATEMENT No. 8.

Financial condition of the several counties for the year 1878-9.

COUNTIES.	Funded Debt.	Floating Debt.	Rates of Interest.	Value of Property owned by County.	Cash in hands of County Treasurer.	Total Value of Property.	Rate of Taxation on each \$100.		Amount of State and County Taxes.
							State.	County.	
Alameda	\$246,944 00	\$53,097 51	7, 8, 10	\$391,000 00	\$69,446 68	\$42,822,877 00	55	{ 45 70	{ \$164,052 18 }
Alpine	22,470 00	22,470 00	6	2,250 00	3,342 19	540,259 00	55	{ 22 18 2 73	{ 14,749 07 }
Anador	76,504 16	76,504 16	7, 10	35,000 00	18,346 94	2,468,642 00	55	{ 1 95 2 50	{ 61,716 05 }
Butte	132,000 00	3,310 00	10	51,500 00	29,883 90	10,743,426 00	55	{ 1 20 1 75	{ 188,009 95 }
Calaveras	97,900 00	70,746 07	8, 10	20,000 00	3,703 16	1,871,750 00	55	{ 2 55 3 10	{ 58,024 25 }
Colusa	29,500 00	4,535 59	10	56,000 00	29,294 06	12,420,308 00	55	{ 95 1 50	{ 186,304 62 }
Contra Costa		91,125 90	7	40,000 00	1,200 20	7,345,096 00	55	{ 1 40 1 95	{ 143,229 37 }
Del Norte		7,556 38	7	7,000 00	1,929 30	696,620 00	55	{ 1 95 2 50	{ 17,415 50 }
El Dorado	254,800 00	11,417 56	7	25,000 00	9,613 32	2,312,590 00	55	{ 1 55 2 10	{ 48,564 39 }
Fresno	39,000 00	310 50	8, 10	71,000 00	43,999 38	6,354,596 00	55	{ 1 32 1 87	{ 118,830 95 }
Humboldt	26,070 50	141,528 85	7, 9	20,000 00	50,455 46	5,481,546 00	55	{ 1 70 2 25	{ 123,334 78 }
Inyo	31,000 00	52,849 96	7	40,500 00	6,105 83	1,353,300 00	55	{ 2 45 3 00	{ 40,599 00 }
Kern	65,000 00	38,728 75	7, 10	45,300 00	8,017 59	6,005,400 00	55	{ 1 55 2 10	{ 126,114 66 }
Lake	59,400 00	3,964 87	7, 8, 12	68,258 00	5,827 39	2,177,014 00	55	{ 2 06 2 61	{ 56,820 07 }
Lassen	19,230 23		10	12,000 00	4,250 41	1,230,764 00	55	{ 2 05 2 60	{ 31,999 86 }
Los Angeles	707,183 66	26,611 07	7, 10	45,000 00	53,974 07	16,368,649 00	55	{ 1 14 1 69	{ 300,396 86 }
Marin	300,000 00	37,805 78	7, 8, 10	105,000 00	5,116 12	8,413,350 00	55	{ 1 10 1 65	{ 138,820 29 }
Mariposa		26,161 69	7	22,000 00	5,589 56	1,295,048 00	55	{ 2 40 2 95	{ 38,203 91 }
Mendocino	132,094 93	30,142 04	7, 8, 9, 10	53,250 00	1,365 62	5,975,903 00	55	{ 1 45 2 00	{ 119,519 26 }
Merced	75,000 00	81,821 92	7, 10	82,200 00	49,503 62	5,308,243 00	55	{ 1 45 2 00	{ 106,164 90 }
Modoc	12,349 79	1,578 60	7, 10	2,476 00	13,303 17	1,267,304 00	55	{ 1 45 2 00	{ 25,346 08 }
Mono	20,400 00	10,663 99	7, 10	3,250 00	11,828 76	969,865 00	55	{ 2 20 2 75	{ 26,671 42 }
Monterey	83,000 00	46,087 41	7	36,750 00	60,805 48	7,185,195 00	55	{ 95 1 50	{ 107,777 92 }
Napa	248,000 00	88,562 47	7, 10	205,000 00		8,016,341 00	55	{ 1 25 1 80	{ 144,294 13 }
Nevada		41,805 80	7	92,000 00	3,797 55	6,926,218 00	55	{ 1 35 1 90	{ 131,598 14 }
Placer			7	19,500 00	18,304 92	5,774,860 00	55	{ 1 05 1 60	{ 92,397 76 }
Plumas	56,850 00	23,503 84	7, 10	16,900 00	16,030 33	2,115,173 00	55	{ 1 85 2 40	{ 50,764 15 }
Sacramento	708,410 00		6, 8	259,050 00	50,289 01	18,416,338 00	55	{ 95 1 50	{ 276,245 07 }

San Benito	16,000 00	8,720 77	7, 10	13,500 00	5,774 91	3,947,728 00	55	95	1 50	59,215 92
San Bernardino		27,003 81	7, 8	47,000 00	7,409 11	2,576,973 00	55	1 65	2 20	63,111 33
San Diego	88,346 82	80,263 00	7, 10	60,250 00	8,047 97	3,525,253 00	55	1 75	2 30	80,269 08
San Francisco †	4,219,500 00		6, 7	13,300,000 00	316,121 71	244,626,760 00	55	1 69	2 24	5,479,639 42
San Joaquin	295,000 00	2,543 02	7, 8, 10	160,500 00	66,024 35	17,377,129 00	55	95	1 50	260,656 94
San Luis Obispo	157,000 00	27,134 54	7, 8, 10	55,500 00		4,376,084 00	55	1 27	1 82	79,644 67
San Mateo	90,000 00	46,244 00	7, 10	32,000 00		6,355,680 00	55	1 45	2 00	127,113 60
Santa Barbara	73,200 00	13,266 37	7, 10	77,800 00	9,211 45	5,337,638 00	55	1 10	1 65	88,071 02
Santa Clara	407,565 60	119,956 60	7, 8	336,000 00	16,231 53	27,603,240 00	55	1 05	1 60	441,651 84
Santa Cruz	208,700 00	31,779 82	7, 8, 10	63,000 00	21,017 90	6,309,724 00	55	1 61	2 16	136,290 04
Shasta		84,034 25	7	22,600 00	7,927 60	1,961,436 00	55	1 95	2 50	49,035 90
Sierra	15,000 00	15,367 91	10	11,000 00	8,129 95	1,496,588 00	55	2 05	2 60	38,911 29
Siskiyou	55,600 00		10	20,000 00	8,473 86	2,651,367 00	55	1 25	1 80	47,724 60
Solano	175,656 33		7	54,900 00	26,630 09	9,042,881 00	55	1 45	2 00	180,557 62
Sonoma	374,700 00	63,704 93	7, 8	239,000 00		15,569,362 00	55	99	1 54	239,768 17
Stanislaus	55,000 00	15,412 16	7, 8, 9	53,000 00	990 74	6,232,441 00	55	98	1 53	93,556 35
Sutter	22,500 00	49,110 66	7, 10	51,500 00	29,986 53	4,120,431 00	55	1 20	1 75	72,107 88
Tehama	67,000 00	58,645 82	7, 8, 10	41,000 00	19,430 17	4,199,998 00	55	1 95	2 50	104,999 95
Trinity		67,383 20	7, 10	12,300 00	4,006 61	868,496 00	55	2 20	2 75	23,883 64
Tulare	106,000 00	53,367 17	7, 10	84,500 00	18,966 63	5,204,777 00	55	1 86	2 41	125,435 13
Tuolumne		29,121 96	7	28,000 00	415 64	1,596,015 00	55	2 00	2 55	40,698 38
Ventura	30,000 00	12,031 55	7, 10	22,000 00	17,289 84	3,270,161 00	55	1 55	2 10	68,673 42
Yolo		99,489 86	7	50,000 00	43,023 98	10,177,427 00	55	1 03	1 58	160,803 35
Yuba	175,400 00	4,142 28	7, 8	65,000 00	17,904 76	4,293,630 00	55	1 75	2 30	106,148 47
Totals	\$9,979,301 86	\$1,901,616 39		\$16,747,534 00	\$1,245,987 22	\$584,578,936 00		2 05	2 60	\$11,408,032 60

* The amount of funded debt in this county includes \$108,500, interest on railroad bonds, as reported by County Clerk.
† To credit of funded debt, \$911,373 89.



STATEMENTS

OF

AMOUNTS CHARGED TAX COLLECTORS,

1877-8 AND 1878-9.

STATEMENT No. 9.

Amounts charged Tax Collectors for the fiscal year 1877-8, and the number of acres of land assessed for said year.

COUNTIES.	Number of Acres of Land.	Value of Real Estate.	Value of Personal Property.	Total Value of Tax-able Property.	Amount of Tax for State Purposes.	Amount of Tax for County Purposes.	Total Amount of Tax charged to Tax Collector.
Alameda	421,225	\$37,844,778 00	\$3,762,116 00	\$41,606,894 00	\$262,123 43	\$199,411 15	\$461,534 58
Alpine	53,499	321,190 00	246,984 00	568,174 00	3,579 49	11,931 66	15,511 15
Amador	152,838	1,864,575 00	676,833 00	2,541,408 00	16,010 87	47,524 33	63,535 20
Butte	497,176	8,406,937 00	2,994,617 00	10,501,554 00	66,159 79	143,871 29	210,031 08
Calaveras	223,194	1,213,668 00	768,829 00	1,982,497 00	12,439 73	48,967 67	61,407 40
Colusa	1,634,133	9,368,431 00	1,968,085 00	11,336,516 00	71,426 17	115,632 66	187,052 83
Contra Costa	444,651	6,031,735 00	1,005,517 00	7,036,952 00	44,332 80	68,258 43	112,591 23
Del Norte	49,072	421,851 00	245,842 00	667,693 00	4,206 46	9,147 40	13,353 86
El Dorado	219,749	1,560,961 00	766,509 00	2,327,470 00	14,663 06	37,239 52	51,902 58
Fresno	1,592,151	4,735,414 00	1,337,953 00	6,073,367 00	38,262 21	80,168 44	118,430 65
Humboldt	689,372	3,524,658 00	1,594,099 00	5,118,757 00	32,248 17	82,923 86	115,172 03
Inyo	48,365	1,652,975 00	682,323 00	1,735,298 00	10,932 38	41,126 56	52,058 94
Kern	1,255,382	4,298,987 00	1,214,938 00	5,513,925 00	34,737 72	86,017 25	120,754 97
Lake	141,586	1,089,908 00	1,066,553 00	2,156,461 00	13,585 70	41,404 05	54,989 75
Lassen	129,869	565,557 00	667,219 00	1,232,776 00	7,766 49	26,134 85	33,901 34
Los Angeles	1,208,026	13,063,951 00	2,726,089 00	15,790,040 00	99,477 25	187,310 94	286,788 19
Marin	317,570	6,886,367 00	1,277,293 00	7,963,570 00	50,170 49	77,246 63	127,417 12
Mariposa	196,079	1,023,299 00	443,917 00	1,467,216 00	9,243 46	34,039 41	43,282 87
Mendocino	706,890	3,949,575 00	2,057,417 00	6,006,992 00	37,844 05	82,295 79	120,139 84
Merced	1,022,370	3,968,858 00	1,065,280 00	5,034,138 00	31,714 94	63,933 30	95,648 24
Modoc	135,054	487,601 00	603,337 00	1,090,938 00	6,872 91	17,127 72	24,000 63
Mono	45,678	365,980 00	311,350 00	617,330 00	3,859 17	10,000 63	13,859 80
Monterey	834,299	5,933,681 00	1,319,121 00	7,252,802 00	45,692 65	63,099 38	108,792 03
Napa	324,644	6,678,715 00	1,317,874 00	7,996,589 00	50,378 51	101,556 68	151,935 19
Nevada	214,170	5,503,107 00	1,530,091 00	7,033,198 00	44,369 14	89,321 61	133,690 75
Placer	293,375	4,277,569 00	1,558,156 00	5,835,725 00	36,763 06	50,770 81	87,535 87
Plumas	186,267	1,416,820 00	624,146 00	2,040,966 00	12,838 08	38,166 07	51,024 15
Sacramento	885,292	13,553,775 00	4,432,725 00	17,986,500 00	113,314 95	156,482 55	269,797 50
San Benito	309,532	3,209,222 00	517,016 00	3,816,238 00	24,042 30	33,201 27	57,243 57
San Bernardino	490,716	1,999,381 00	409,094 00	2,408,355 00	15,172 82	43,097 48	58,270 30
San Diego	919,444	3,266,910 00	900,278 00	4,167,188 00	26,253 28	72,925 79	99,179 07
San Francisco	6,909	190,972,730 00	63,893,080 00	254,865,810 00	1,605,654 60	3,058,389 72	4,664,044 32

San Joaquin	855,357	14,208,069 00	3,068,653 00	17,276,722 00	108,843 11	133,030 47	241,873 58
San Luis Obispo	1,029,719	3,346,443 00	799,467 00	4,145,910 00	26,119 23	36,069 42	62,188 65
San Mateo	263,944	5,703,938 00	806,618 00	6,510,556 00	41,016 60	76,173 48	117,190 28
Santa Barbara	1,277,388	3,478,899 00	708,276 00	4,187,175 00	26,379 20	51,083 63	77,462 73
Santa Clara	567,526	24,120,880 00	3,869,570 00	27,990,450 00	176,339 84	271,507 36	447,847 20
Santa Cruz	231,052	5,548,272 00	960,519 00	6,508,791 00	41,005 38	89,170 43	130,175 81
Shasta	124,088	1,038,916 00	914,663 00	1,953,579 00	12,307 54	36,531 93	48,839 47
Sierra	88,682	1,257,252 00	382,435 00	1,639,687 00	10,204 03	31,907 82	42,111 85
Siskiyou	209,824	1,530,403 00	1,107,633 00	2,638,036 00	16,619 62	30,865 02	47,484 64
Solano	491,041	7,262,743 00	1,759,358 00	9,022,101 00	56,839 24	132,624 88	189,464 12
Sonoma	698,687	12,728,570 00	2,820,094 00	15,548,664 00	97,956 58	143,047 71	241,004 29
Stanislaus	781,977	4,306,863 00	1,118,253 00	5,425,116 00	34,178 23	55,336 18	89,514 41
Sutter	374,762	3,200,675 00	787,449 00	3,988,124 00	23,125 28	46,660 94	71,786 22
Tehama	452,672	2,681,628 00	1,157,833 00	3,839,461 00	24,188 60	60,279 54	84,468 14
Trinity	33,677	492,632 00	312,025 00	804,657 00	5,069 34	17,058 73	22,128 07
Tulare	931,412	3,676,073 00	1,130,597 00	4,806,670 00	30,280 76	73,058 34	103,339 10
Tuolumne	176,148	1,055,980 00	567,570 00	1,623,550 00	10,417 36	33,401 71	43,819 07
Ventura	455,079	2,555,121 00	481,075 00	3,036,196 00	19,128 03	35,323 50	54,631 53
Yolo	540,075	8,219,740 00	1,713,235 00	9,932,975 00	62,577 73	101,316 35	163,894 08
Yuba	224,409	3,659,915 00	1,231,500 00	4,891,415 00	27,035 92	87,566 92	114,602 84
Totals	24,856,826	\$458,172,198 00	\$128,780,824 00	\$586,953,022 00	\$3,697,803 75	\$6,760,939 36	\$10,458,743 11

STATEMENT No. 10.

Amounts charged Tax Collectors for the fiscal year 1878-9, and the number of acres of land assessed for said year.

COUNTIES.	Number of Acres of Land.	Value of Real Estate.	Value of Personal Property.	Total Value of Tax-able Property.	Amount of Tax for State Purposes.	Amount of Tax for County Purposes.	Total Amount of Tax charged to Tax Collector.
Alameda	411,205	\$39,103,894 00	\$3,716,983 00	\$42,822,877 00	\$235,525 81	\$228,526 37	\$464,052 18
Alpine	33,341	284,159 00	256,100 00	540,259 00	2,971 42	11,777 65	14,749 07
Amador	164,567	1,847,870 00	620,772 00	2,468,642 00	13,377 53	48,138 52	61,716 05
Butte	491,209	8,653,977 00	2,090,349 00	10,743,426 00	59,088 84	128,921 11	188,009 95
Calaveras	217,936	1,245,669 00	626,081 00	1,871,750 00	10,294 63	47,729 62	58,024 25
Colusa	1,039,506	10,642,916 00	1,777,392 00	12,420,308 00	68,311 69	117,992 93	186,304 62
Contra Costa	494,816	6,381,081 00	964,015 00	7,345,096 00	40,398 03	102,831 34	143,229 37
Del Norte	50,368	434,789 00	261,831 00	696,620 00	3,831 41	17,415 50	21,246 91
El Dorado	226,644	1,556,620 00	755,970 00	2,312,590 00	12,719 24	35,845 15	48,564 39
Fresno	1,847,652	4,143,378 00	2,211,018 00	6,354,396 00	34,950 28	83,880 67	118,830 95
Humboldt	727,515	3,875,995 00	1,605,551 00	5,481,546 00	30,148 50	93,186 28	123,334 78
Inyo	66,936	781,898 00	571,402 00	1,353,300 00	7,443 15	33,155 85	40,599 00
Kern	1,297,060	4,316,653 00	1,688,807 00	6,005,460 00	33,030 02	93,084 63	126,114 66
Lake	150,767	1,662,024 00	514,390 00	2,177,014 00	11,073 58	44,846 49	56,820 07
Lassen	204,342	590,853 00	639,911 00	1,230,764 00	6,769 20	25,230 66	31,999 86
Los Angeles	1,339,089	13,731,872 00	2,636,777 00	16,368,649 00	90,027 57	210,369 29	300,396 86
Marin	319,900	7,071,156 00	1,342,194 00	8,413,350 00	46,273 43	92,546 86	138,820 29
Mariposa	191,747	879,127 00	415,321 00	1,295,048 00	7,122 76	31,081 15	38,203 91
Mendocino	749,475	4,033,950 00	1,942,013 00	5,975,963 00	32,867 80	86,951 46	119,519 26
Merced	989,311	4,182,104 00	1,126,141 00	5,308,245 00	29,195 35	76,969 55	106,164 90
Modoc	164,077	582,985 00	684,319 00	1,267,304 00	6,970 17	18,375 91	25,346 08
Mono	53,187	605,150 00	364,715 00	969,865 00	5,334 28	21,337 14	26,671 42
Monterey	769,221	6,016,424 00	1,168,771 00	7,185,195 00	39,518 57	68,239 35	107,777 92
Napa	338,143	6,718,390 00	1,297,951 00	8,016,341 00	44,089 87	100,204 26	144,294 13
Nevada	223,133	5,492,909 00	1,433,309 00	6,926,218 00	38,094 19	93,503 95	131,598 14
Placer	336,944	4,277,253 00	1,497,607 00	5,774,860 00	31,761 73	60,636 03	92,397 76
Plumas	189,085	1,546,210 00	568,963 00	2,115,173 00	11,633 45	39,130 70	50,764 15
Sacramento	616,335	14,213,568 00	4,202,770 00	18,416,338 00	101,289 86	174,055 21	276,245 07
San Benito	311,997	3,410,501 00	537,227 00	3,947,728 00	21,712 50	37,503 42	59,215 92
San Bernardino	441,543	2,150,253 00	420,720 00	2,570,973 00	14,173 35	48,937 98	63,111 33
San Diego	391,568	2,382,795 00	1,145,458 00	3,528,253 00	19,388 90	60,880 18	80,269 08
San Francisco	6,885	190,389,410 00	54,237,350 00	244,626,760 00	1,245,447 18	4,134,192 24	5,479,639 42

San Joaquin	856,807	14,502,255 00	2,874,874 00	17,377,129 00	95,574 20	165,082 74	260,656 94
San Luis Obispo	987,107	3,414,838 00	961,246 00	4,376,084 00	24,008 46	55,576 21	79,644 67
San Mateo	290,427	5,624,855 00	730,825 00	6,355,680 00	31,456 24	92,157 36	127,113 60
Santa Barbara	913,415	4,393,976 00	942,562 00	5,337,538 00	29,357 01	58,714 01	88,071 02
Santa Clara	557,837	24,181,865 00	3,421,375 00	27,603,240 00	151,817 82	280,834 02	441,651 84
Santa Cruz	236,826	5,412,514 00	897,210 00	6,309,724 00	34,703 48	101,586 56	136,290 04
Shasta	123,222	1,084,196 00	877,240 00	1,961,436 00	10,787 90	38,248 00	49,035 90
Sierra	86,530	1,156,966 00	339,622 00	1,496,588 00	8,281 23	30,680 06	38,911 29
Siskiyou	198,716	1,503,092 00	1,148,275 00	2,651,367 00	14,582 52	33,142 08	47,724 60
Solano	503,288	7,407,641 00	1,635,240 00	9,042,881 00	49,735 85	131,121 77	180,857 62
Sonoma	718,449	12,884,150 00	2,685,212 00	15,569,362 00	85,631 49	154,136 68	239,768 17
Stanislaus	775,249	5,068,521 00	1,163,920 00	6,232,441 00	34,278 42	95,356 35	129,634 77
Sutter	372,206	3,368,429 00	752,022 00	4,120,451 00	22,662 47	49,415 41	72,107 88
Tehama	491,655	3,022,073 00	1,177,925 00	4,199,998 00	23,999 99	81,899 96	104,999 95
Trinity	63,962	538,675 00	329,821 00	868,496 00	4,776 73	19,106 91	23,883 64
Tulare	1,223,190	4,010,559 00	1,193,918 00	5,204,477 00	28,626 27	96,808 86	125,435 13
Tuolumne	175,878	1,080,685 00	515,330 00	1,596,015 00	8,778 10	31,920 28	40,698 38
Ventura	448,531	2,711,630 00	558,531 00	3,270,161 00	17,985 89	50,687 53	68,673 42
Yolo	544,264	8,604,742 00	1,572,685 00	10,177,427 00	55,975 85	104,827 35	160,803 35
Yuba	205,028	3,087,390 00	1,206,240 00	4,293,630 00	23,611 97	82,533 50	106,148 47
Totals	24,641,091	\$466,273,585 00	\$118,304,451 00	\$584,578,036 00	\$3,215,179 19	\$8,192,853 41	\$11,408,032 60



Statement of Delinquent Taxes for 1877-8 and 1878-9.

STATEMENT No. 11.

Delinquent taxes charged Tax Collectors for the fiscal year 1877-8.

COUNTIES.	Real Estate Delinquent for Taxes.	Personal Property Delinquent for Taxes.	Delinquent Tax on Real Estate for State Purpose.	Delinquent Tax on Personal Property for State Purpose.	Total Delinquent Tax for State Purposes.
Alameda	\$3,031,200 00	\$216,717 00	\$19,096 56	\$1,365 31	\$20,461 87
Alpine	136,112 00	83,600 00	857 49	359 28	1,236 77
Amador	173,345 00	97,522 00	1,092 07	614 39	1,706 46
Butte	404,219 00	54,658 00	2,546 58	344 15	2,890 73
Calaveras	213,092 00	83,949 00	1,342 48	528 88	1,871 36
Colusa	444,633 00	146,753 00	2,891 19	924 54	3,725 73
Contra Costa	837,707 00	63,784 00	5,277 55	401 84	5,679 39
Del Norte	18,441 00	7,147 00	116 18	45 02	161 20
El Dorado	303,635 00	92,579 00	1,912 90	583 25	2,496 15
Fresno	648,714 00	562,031 00	4,086 90	3,540 80	7,627 70
Humboldt	354,313 00	149,239 00	2,232 17	940 20	3,172 37
Inyo	260,232 00	108,268 00	1,639 46	682 09	2,321 55
Kern	370,618 00	197,054 00	2,334 89	1,241 44	3,576 33
Lake	175,303 00	63,598 00	1,104 41	400 66	1,505 07
Lassen	89,527 00	86,982 00	564 02	547 98	1,112 00
Los Angeles	2,235,593 00	499,766 00	14,084 25	3,148 59	17,232 84
Marin	571,559 00	96,055 00	3,600 82	605 02	4,205 84
Mariposa	114,302 00	66,981 00	720 11	421 98	1,142 09
Mendocino	332,643 00	134,137 00	2,095 65	845 19	2,940 84
Merced	344,806 00	110,677 00	2,172 27	697 27	2,869 54
Modoc	90,800 00	91,785 00	572 60	578 25	1,150 85
Mono	21,710 00	29,515 00	136 77	185 95	322 72
Monterey	523,110 00	142,326 00	3,295 59	896 65	4,192 24
Napa	391,095 00	123,779 00	2,463 90	779 81	3,243 71
Nevada	346,005 00	101,205 00	2,179 83	637 58	2,817 41
Placer	283,731 00	119,748 00	1,787 50	754 41	2,541 91
Plumas	187,942 00	56,809 00	1,184 03	357 89	1,541 92
Sacramento	552,005 00	375,220 00	3,477 64	2,363 88	5,841 52
San Benito	207,522 00	62,460 00	1,307 39	393 50	1,700 89
San Bernardino	335,207 00	61,673 00	2,112 18	388 54	2,500 72
San Diego	616,636 00	240,955 00	3,884 81	1,518 02	5,402 83

San Francisco	12,817,928 00	\$27,857,873 00	80,752 95	175,504 60	256,257 55
San Joaquin	257,885 00	178,239 00	1,624 68	1,122 90	2,747 58
San Luis Obispo	431,015 00	109,697 00	2,715 39	691 10	3,406 49
San Mateo	588,340 00	77,265 00	3,706 54	486 76	4,193 30
Santa Barbara	436,379 00	89,550 00	2,750 45	564 16	3,314 61
Santa Clara	712,275 00	133,290 00	4,487 33	839 72	5,327 05
Santa Cruz	399,897 00	54,681 00	2,494 15	344 49	2,838 64
Shasta	70,161 00	74,657 00	442 01	470 34	912 35
Sierra	106,670 00	26,765 00	672 02	168 62	840 64
Siskiyou	69,110 00	45,658 00	435 38	287 64	723 02
Solano	311,492 00	77,135 00	1,962 40	485 95	2,448 35
Sonoma	545,850 00	298,386 00	4,068 86	1,879 83	5,948 69
Stanislaus	460,478 00	95,689 00	2,901 01	602 84	3,503 85
Sutter	147,435 00	28,709 00	928 84	180 86	1,109 70
Tehama	86,335 00	72,463 00	543 91	456 51	1,000 42
Trinity	74,416 00	27,432 00	468 82	172 82	641 64
Tulare	341,825 00	198,578 00	2,125 30	1,234 66	3,359 96
Tuolumne	201,284 00	56,040 00	1,268 08	353 05	1,621 13
Ventura	370,930 00	64,398 00	2,336 86	406 97	2,743 83
Yolo	408,864 00	69,012 00	2,575 84	434 77	3,010 61
Yuba	86,660 00	46,935 00	545 96	295 69	841 65
Totals	\$33,637,336 00	\$34,011,594 00	\$211,886 97	\$214,256 64	\$26,143 61

* "Personal property delinquent for taxes," in San Francisco, represents only the State delinquency.

STATEMENT No. 12.

Delinquent taxes charged Tax Collectors for the fiscal year 1878-9.

COUNTIES.	Real Estate Delin- quent for Taxes.	Personal Property Delinquent for Taxes.	Delinquent Tax on Real Estate, for State Purposes.	Delinquent Tax on Personal Prop- erty, for State Purposes.	Total Delinquent Tax for State Purposes.
Alameda	\$3,029,624 00	\$218,119 00	\$16,662 93	\$1,199 65	\$17,862 58
Alpine	151,294 00	69,766 00	832 12	383 71	1,215 83
Amador	160,352 00	74,961 00	881 93	412 28	1,294 21
Butte	711,470 00	118,241 00	3,913 08	650 32	4,563 40
Calaveras	198,989 00	59,528 00	1,094 44	327 40	1,421 84
Colusa	609,171 00	229,227 00	3,350 44	1,260 75	4,611 19
Contra Costa	811,845 00	86,781 00	4,465 15	4,477 29	4,942 44
Del Norte	24,973 00	7,651 00	137 35	42 07	179 42
El Dorado	264,755 00	73,125 00	1,456 15	402 19	1,858 34
Fresno	638,366 00	338,488 00	5,511 01	1,861 68	5,372 69
Humboldt	308,571 00	130,078 00	1,697 14	715 42	2,412 56
Inyo	272,930 00	183,624 00	1,501 12	1,009 93	2,511 05
Kern	1,062,591 00	304,321 00	5,844 25	1,673 76	7,518 01
Lake	175,567 00	75,235 00	965 62	413 79	1,379 41
Lassen	101,891 00	107,611 00	560 40	591 86	1,152 26
Los Angeles	2,195,641 00	479,534 00	12,076 02	2,637 43	14,713 45
Marin	735,729 00	103,617 00	4,046 51	569 90	4,616 41
Mariposa	270,524 00	64,494 00	1,487 88	354 72	1,842 60
Mendocino	446,406 00	218,335 00	2,455 23	1,200 84	3,656 07
Merced	323,394 00	139,836 00	1,778 67	769 10	2,547 77
Modoc	124,432 00	123,977 00	684 37	681 87	1,366 24
Mono	121,705 00	72,221 00	669 38	397 21	1,066 59
Monterey	362,058 00	77,649 00	1,991 32	427 07	2,418 39
Napa	367,830 00	105,528 00	2,923 06	580 40	2,603 46
Nevada	348,515 00	62,685 00	1,916 83	344 76	2,261 59
Placer	326,235 00	79,843 00	1,794 29	439 14	2,233 43
Plumas	216,577 00	65,414 00	1,191 18	359 77	1,550 95
Sacramento	590,045 00	210,250 00	3,245 24	1,156 37	4,401 61
San Benito	514,784 00	72,080 00	2,831 31	396 44	3,227 75
San Bernardino	514,125 00	72,660 00	2,827 69	329 63	3,227 32
San Diego	264,376 00	82,481 00	1,454 07	82 45	1,907 71

San Francisco*	16,700,315 00	\$20,463,450 00	91,851 90	112,548 98	204,400 88
San Joaquin	348,395 00	239,878 00	1,916 17	1,319 32	3,235 49
San Luis Obispo	410,633 00	132,170 00	2,258 48	726 93	2,985 41
San Mateo	768,180 00	72,617 00	4,224 82	399 39	4,624 21
Santa Barbara	548,634 00	130,923 00	3,014 18	715 12	3,729 30
Santa Clara	1,002,265 00	106,738 00	5,512 46	587 06	6,099 52
Santa Cruz	369,317 00	128,399 00	2,031 23	706 19	2,737 42
Shasta	82,910 00	92,682 00	456 00	509 75	965 75
Sierra	116,885 00	24,440 00	643 42	134 42	777 84
Siskiyou	168,145 00	86,402 00	924 79	475 21	1,400 00
Solano	375,719 00	90,886 00	2,066 46	499 87	2,566 33
Sonoma	802,250 00	164,111 00	4,412 37	902 61	5,314 98
Stanislaus	394,862 00	77,559 00	2,171 74	426 46	2,598 20
Sutter	244,735 00	76,009 00	1,346 03	418 04	1,764 07
Tehama	168,828 00	120,506 00	928 55	662 78	1,591 33
Trinity	60,757 00	31,470 00	334 13	171 13	505 56
Tulare	393,210 00	170,990 00	2,162 65	940 47	3,103 12
Tuolumne	135,256 00	42,120 00	732 90	231 66	964 56
Ventura	349,631 00	107,197 00	1,922 97	589 58	2,512 55
Yolo	455,351 00	89,470 00	2,504 43	492 08	2,996 51
Yuba	123,925 00	47,700 00	679 39	262 35	941 74
Totals	\$40,262,098 00	\$26,601,857 00	\$221,441 25	\$146,310 09	\$367,751 34

* Personal property delinquent for taxes, in San Francisco, represents only the State delinquency.

STATEMENT

OF

Amounts of State Tax Levied, Amounts Collected, and Amounts Delinquent

IN THE

SEVERAL COUNTIES, FOR ASSESSMENT OF PROPERTY TAXES OF 1877-8 AND 1878-9,

On the 30th day of June, 1879.

STATEMENT No. 13.

Amounts of State tax levied, amounts collected, and amounts delinquent in the several counties for and on account of assessment of property (tax of 1877-8), on the 30th day of June, 1879.

COUNTIES.	Amounts Levied.	Amounts Collected.	Amounts Delinquent.
Alameda	\$262,123 43	\$257,890 22	\$4,233 21
Alpine	3,579 49	2,782 92	796 57
Amador	16,010 87	15,601 77	409 10
Butte	66,159 79	66,423 75	-----
Calaveras	12,489 73	11,799 92	689 81
Colusa	71,420 17	71,189 55	230 62
Contra Costa	44,332 80	44,216 62	116 18
Del Norte	4,206 46	4,176 26	30 20
El Dorado	14,663 06	14,343 63	319 43
Fresno	38,262 21	36,260 10	2,002 11
Humboldt	32,248 17	31,692 79	555 38
Inyo	10,932 38	9,668 10	1,264 28
Kern	34,737 72	30,843 23	3,894 49
Lake	13,585 70	13,249 75	335 95
Lassen	7,766 49	7,478 88	287 61
Los Angeles	99,477 25	97,839 81	1,637 44
Marin	50,170 49	49,783 46	387 03
Mariposa	9,243 46	9,052 69	190 77
Mendocino	37,844 05	37,045 22	798 83
Merced	31,714 94	31,243 21	471 73
Modoc	6,872 91	6,468 03	404 88
Mono	3,889 17	3,809 66	79 51
Monterey	45,692 65	44,453 96	1,238 69
Napa	50,378 51	49,736 80	641 71
Nevada	44,309 14	43,980 02	329 12
Placer	36,765 06	36,190 70	574 36
Plumas	12,858 08	12,658 31	199 77
Sacramento	113,314 95	112,057 64	1,257 31
San Benito	24,042 30	23,918 91	123 39
San Bernardino	15,172 82	13,873 60	1,299 22
San Diego	26,253 28	24,737 95	1,515 33
San Francisco	1,605,654 60	1,452,489 89	153,164 71
San Joaquin	108,843 11	108,130 95	712 16
San Luis Obispo	26,119 23	25,308 17	811 06
San Mateo	41,016 60	40,540 56	476 04
Santa Barbara	26,379 20	25,433 34	945 86
Santa Clara	176,339 84	175,901 94	437 90
Santa Cruz	41,005 38	40,652 94	352 44
Shasta	12,307 54	12,119 74	187 80
Sierra	10,204 03	9,947 50	256 53
Siskiyou	16,619 62	16,531 88	87 74
Solano	56,839 24	56,250 55	588 69
Sonoma	97,956 58	97,111 39	845 19
Stanislaus	34,178 23	33,842 95	335 28
Sutter	25,125 28	24,982 58	142 70
Tehama	24,188 60	23,829 88	358 72
Trinity	5,069 34	4,982 97	86 37
Tulare	30,280 76	29,513 65	767 11
Tuolumne	10,417 36	10,081 30	336 06
Ventura	19,128 03	18,546 62	581 41
Yolo	62,577 73	62,523 52	54 21
Yuba	27,035 92	26,916 06	119 86
Totals	\$3,697,803 75	\$3,510,105 84	\$187,661 87

STATEMENT No. 14.

Amounts of State tax levied, amounts collected, and amounts delinquent in the several counties for and on account of assessment of property (tax of 1878-9), on the 30th day of June, 1879.

COUNTIES.	Amounts Levied.	Amounts Collected.	Amounts Delinquent.
Alameda*	\$235,525 81	\$235,723 48	-----
Alpine	2,971 42	2,044 09	\$927 33
Amador	13,577 53	13,065 91	511 62
Butte*	59,088 84	59,470 71	-----
Calaveras	10,294 63	9,886 78	407 85
Colusa	68,311 69	67,927 94	383 75
Contra Costa	40,398 03	40,070 12	327 91
Del Norte	3,831 41	3,782 42	48 99
El Dorado	12,719 24	12,600 11	119 13
Fresno	34,950 28	32,205 44	2,744 84
Humboldt	30,148 50	28,941 35	1,207 15
Inyo	7,443 15	6,937 29	505 86
Kern	33,030 03	29,594 85	3,435 18
Lake	11,973 58	11,601 42	372 16
Lassen	6,769 20	6,277 36	491 84
Los Angeles	90,027 57	88,171 68	1,855 89
Marin	46,273 43	44,303 21	1,970 22
Mariposa	7,122 76	6,949 38	173 38
Mendocino	32,867 80	31,972 29	895 51
Merced	29,195 35	29,013 38	181 97
Modoc	6,970 17	6,555 51	414 66
Mono	5,334 28	5,105 97	228 31
Monterey	39,518 57	39,468 67	49 90
Napa	44,089 87	43,566 50	523 37
Nevada	38,094 19	37,750 30	343 89
Placer	31,761 73	31,450 43	311 30
Plumas	11,633 45	9,855 65	1,777 80
Sacramento	101,289 86	100,175 04	1,114 82
San Benito	21,712 50	21,577 88	134 62
San Bernardino	14,173 35	13,353 75	819 60
San Diego	19,388 90	18,645 90	743 00
San Francisco	1,345,447 18	1,236,797 45	108,649 73
San Joaquin	95,574 20	94,964 89	609 31
San Luis Obispo	24,068 46	23,273 17	795 29
Sau Mateo	34,956 24	34,506 74	449 50
Santa Barbara	29,357 01	27,984 20	1,372 81
Santa Clara	151,817 82	151,381 17	436 65
Santa Cruz	34,703 48	34,050 86	652 62
Shasta	10,787 90	10,479 59	308 31
Sierra	8,231 23	7,953 94	277 29
Siskiyou	14,582 52	14,522 58	59 94
Solano	49,735 85	49,227 15	508 70
Sonoma	85,631 49	84,741 99	889 50
Stanislaus	34,278 42	33,962 59	315 83
Sutter	22,662 47	22,391 33	271 14
Tehama	23,099 99	22,532 14	567 85
Trinity	4,776 75	4,272 40	504 33
Tulare	28,626 27	27,745 65	880 62
Tuolumne	8,778 10	8,467 06	311 04
Ventura	17,985 89	17,617 90	367 99
Yolo	55,975 85	55,932 92	42 93
Yuba	23,614 97	23,565 92	49 05
Totals	\$3,215,179 19	\$3,074,416 45	\$141,342 28

*The two preceding statements show that the Counties of Alameda and Butte have each collected more property tax than was originally due. This is hardly probable, and I account for it by assuming that the property tax of some other years has been reported as property tax of these years.



STATEMENT OF COMMISSIONS AND MILEAGE

ALLOWED

For Assessing, Auditing, Collecting, Keeping, and Paying In State Taxes

FOR

THE 29th AND 30th FISCAL YEARS.

STATEMENT No. 15.

Commissions and mileage allowed for assessing, auditing, collecting, keeping, and paying in State taxes for the 29th fiscal year, commencing July 1st, 1877, and ending June 30th, 1878.

COUNTIES.	Assessors' Commissions.	Auditors' Commissions.	Treasurers' Commissions and Mileage.	Tax Collectors' Commissions.	Assessors' Commissions, as Collector on Personal Property.	Total.
Alameda	\$3,244 06	\$2,183 05	\$4,672 70	\$3,362 02	\$43 55	\$13,505 38
Alpine	99 86	49 93	224 10	90 47	66	465 02
Anador	554 47	277 23	317 77	299 96		1,449 43
Butte	1,348 28	761 21	1,224 63	912 10	68 65	4,314 87
Calaveras	455 80	227 90	299 56	224 14	5 43	1,210 83
Colusa	1,408 47	806 55	1,339 88	512 30	9 04	4,076 04
Contra Costa	1,106 20	587 47	925 64	703 23	138 16	3,460 70
Del Norte	161 40	80 70	171 30	143 15	23	558 78
El Dorado	515 56	237 78	295 64	519 15		1,558 13
Fresno	963 05	492 04	747 40	564 42	2 83	2,769 74
Humboldt	845 70	425 51	625 32	425 55	1 62	2,321 00
Inyo	333 23	176 61	337 62	182 30	11 93	1,081 69
Kern	886 88	443 44	725 44	465 91	8 75	2,530 42
Lake	490 04	245 02	395 26	269 04		1,399 36
Lassen	292 86	146 43	276 58	194 46	62	910 95
Los Angeles	1,640 56	980 42	1,886 12	1,332 29	41 24	5,880 63
Marin	1,185 11	640 07	954 37	775 84	1 19	3,556 58
Mariposa	341 72	170 86	277 13	190 21	13 82	993 74
Mendocino	1,007 43	521 63	829 48	587 44	11 44	2,937 42
Merced	871 22	435 61	602 10	497 08	9 15	2,415 16
Modoc	252 89	126 44	312 18	202 17	37	894 05
Mono	158 16	79 08	270 06	125 63	1 69	624 62
Monterey	1,214 83	661 12	1,387 47	723 54	15 03	4,001 99
Napa	1,186 18	640 79	927 95	751 86		3,506 78
Nevada	1,118 31	595 54	619 82		38 27	2,671 94
Placer	953 25	485 50	629 29	622 76	2 49	2,693 29
Plumas	569 48	254 74	332 63	264 81	1 23	1,382 89
Sacramento	1,808 76	1,106 79	2,007 52	837 30	6 99	5,767 36
San Benito	746 56	373 28	536 68	480 53		2,141 36
San Bernardino	510 64	255 32	446 40	290 15	1 35	1,503 86

San Diego	777 32	388 66	627 36	379 49	17 70	2,190 53
San Francisco	25,246 37	5,183 23	9,355 70	9,563 99	---	49,349 29
San Joaquin	1,739 59	1,063 67	1,950 03	1,544 93	16 04	6,314 26
San Luis Obispo	770 04	385 02	619 48	486 32	3 85	2,264 71
San Mateo	1,048 37	548 91	798 17	645 01	3 82	3,044 28
Santa Barbara	771 20	385 60	621 84	436 16	10 52	2,225 32
Santa Clara	2,468 86	1,691 65	3,405 60	---	132 59	7,608 70
Santa Cruz	1,062 85	558 57	895 82	---	8 48	3,156 32
Shasta	457 32	228 66	297 91	630 60	1 60	1,240 20
Sierra	390 06	195 03	269 50	254 71	---	1,063 69
Siskiyou	591 36	295 67	491 89	209 10	13 51	1,769 30
Solano	1,253 96	690 47	1,034 41	1,126 15	63	4,105 62
Sonoma	1,658 50	993 88	1,831 12	1,352 94	2 67	5,839 11
Stanislaus	922 03	491 11	617 95	555 55	15 31	2,571 95
Sutter	792 20	396 10	479 68	473 78	---	2,141 76
Tehama	768 16	384 08	529 58	419 12	2 71	2,100 65
Trinity	192 82	96 41	257 97	155 41	---	702 61
Tulare	850 32	425 16	660 66	475 37	95	2,412 46
Tuolumne	394 46	197 23	255 80	221 79	---	1,069 28
Ventura	596 68	298 34	495 23	367 01	2 43	1,759 69
Yolo	1,330 43	747 83	1,154 82	941 01	50 71	4,224 80
Yuba	830 72	415 36	516 96	427 43	---	2,190 47
Totals	\$71,144 58	\$30,428 50	\$52,102 52	\$87,529 85	\$723 56	\$191,929 01

STATEMENT No. 16.

Commissions and mileage allowed for assessing, collecting, and paying in State taxes for the 30th fiscal year, commencing July 1st, 1878, and ending June 30th, 1879.

COUNTIES.	Assessors' Commis- sions.	Auditors' Commis- sions.	Treasurers' Com- missions and Mileage.	Tax Collectors' Com- missions.	Assessors' Commis- sions, as Collec- tor on Personal Property.	Total.
Alameda	\$2,046 40	\$2,034 79	\$4,145 98	\$2,929 78	\$250 37	\$12,407 32
Alpine	95 07	47 53	220 17	71 97	18 67	453 41
Anamor	491 58	245 79	293 51	245 57	11 42	1,287 87
Butte	1,279 96	709 97	1,053 21	785 86	158 87	3,989 87
Calaveras	390 09	195 04	224 68	184 63	5 91	1,000 37
Colusa	1,364 95	773 72	1,213 76	440 00	22 05	3,814 48
Contra Costa	1,034 56	539 70	773 42	567 95	58 95	2,974 58
Del Norte	146 44	73 22	161 78	119 63	1 68	502 75
El Dorado	466 14	233 08	254 30	435 75	-----	1,389 27
Fresno	962 64	491 77	721 42	533 11	40 05	2,748 99
Humboldt	909 40	456 27	625 71	411 28	7 08	2,409 74
Inyo	298 24	149 12	326 97	133 62	25 21	953 16
Kern	934 98	471 60	743 80	454 47	114 57	2,719 42
Lake	447 60	223 80	360 72	232 27	-----	1,254 39
Lassen	257 96	128 98	255 71	172 56	22	815 43
Los Angeles	1,597 09	947 84	1,738 78	1,136 63	56 50	5,476 84
Marin	1,104 47	586 33	822 94	654 24	16 15	3,184 13
Mariposa	255 60	127 80	248 46	161 23	10 93	804 02
Mendocino	922 19	464 80	702 22	479 14	32 08	2,600 43
Merced	910 33	456 91	616 76	549 89	87 76	2,621 65
Modoc	264 02	132 01	211 62	197 52	21 41	809 58
Monro	199 98	99 99	284 61	142 31	9 52	736 41
Monterey	1,030 37	536 91	1,038 50	710 51	102 20	3,418 49
Napa	1,095 40	580 26	784 67	637 38	-----	3,097 71
Nevada	1,009 47	522 98	701 70	512 68	6 80	2,240 95
Placer	915 47	460 31	559 65	229 38	12 40	2,460 51
Plumas	393 46	196 73	277 48	719 13	2 79	1,099 84
Sacramento	1,676 72	1,016 00	1,734 65	428 83	371 21	5,517 71
San Benito	743 13	371 56	516 86	249 14	24 22	2,084 60
San Bernardino	493 30	246 65	423 51	-----	10 79	1,423 39

San Diego	679 31	339 66	531 77	169 13	62 58	1,782 45
San Francisco	20,655 38	3,951 18	8,021 79	8,107 05	---	40,708 40
San Joaquin	1,715 13	1,016 72	1,714 05	1,265 87	64 16	5,775 93
San Luis Obispo	794 21	397 10	623 30	427 38	16 09	2,258 08
San Mateo	961 04	490 24	665 78	512 63	14 19	2,643 88
Santa Barbara	887 49	443 75	703 25	488 66	49 23	2,572 38
Santa Clara	2,207 30	1,405 49	2,811 04	---	88 96	6,512 79
Santa Cruz	990 97	490 65	746 67	500 81	23 54	2,722 64
Shasta	411 34	205 67	318 33	212 75	18 38	1,166 47
Sierra	314 40	157 20	229 07	160 45	---	861 12
Siskiyou	523 64	261 82	440 21	312 37	23 85	1,561 89
Solano	1,175 80	633 88	868 67	983 32	3 07	3,664 74
Sonoma	1,542 24	906 68	1,563 06	477 37	115 03	4,604 38
Stanislaus	991 35	510 89	680 28	585 69	29 07	1,929 97
Sutter	740 46	370 23	415 68	402 45	1 15	1,929 97
Tehama	742 92	371 46	486 62	338 63	47 00	1,986 63
Trinity	165 95	82 97	156 93	126 31	4 17	536 36
Tulare	878 34	439 17	664 46	441 75	7 71	2,431 43
Tuolumne	332 42	166 21	221 35	184 56	---	904 54
Ventura	800 25	400 12	672 70	333 92	18 14	2,225 13
Yolo	1,243 88	695 40	958 68	793 52	37 47	3,728 95
Yuba	703 24	381 62	437 59	353 74	50 42	1,986 61
Totals	\$64,294 07	\$27,639 57	\$45,973 83	\$31,714 87	\$2,137 02	\$171,719 36

STATEMENT

OF

Amounts Received and Disbursed for Account of the State School Fund

FROM

FEBRUARY, 1877, TO FEBRUARY, 1879.

STATEMENT No. 17.

Amount received for school purposes from interest on State school land and from property tax from the several counties of the State, and from other sources, for the year ending February 16th, 1878, and total amount distributed to the several counties for the same time.

COUNTIES.	Interest on School Lands.	Property Tax.	Total Amount.	Amount Distrib- uted.
Balance from February, 1877, apportionment			\$484 33	
Alameda	\$538 02	\$100,169 22	100,507 24	\$99,013 97
Alpine	53 78	812 57	866 35	899 84
Amador	392 46	10,377 62	10,770 08	20,435 84
Butte	866 85	25,053 76	25,920 61	30,199 89
Calaveras	769 65	4,359 61	5,129 26	16,694 40
Colusa	1,684 11	27,345 51	29,029 62	21,312 00
Contra Costa	316 57	18,708 38	19,024 95	26,253 22
Del Norte	999 90	1,322 06	2,321 96	3,536 21
El Dorado	1,299 35	5,246 10	6,545 45	19,212 37
Fresno	2,513 36	14,271 88	16,785 24	14,910 50
Humboldt	2,675 87	10,617 42	13,293 29	28,131 84
Inyo	126 06	4,066 75	4,192 81	3,915 09
Kern	3,003 43	11,938 76	14,942 19	8,848 42
Lake	1,183 90	5,085 33	6,269 23	13,110 82
Lassen	1,650 08	2,543 15	4,193 23	5,738 45
Los Angeles	1,541 72	38,278 98	39,820 70	81,277 65
Marin		19,135 03	19,135 03	14,926 29
Mariposa	745 67	3,306 43	4,052 10	7,893 33
Mendocino	10,990 42	14,334 05	25,324 47	26,190 08
Merced	1,224 67	11,440 73	12,665 40	8,887 89
Modoc	354 49	2,108 88	2,460 37	7,269 76
Mono	1,467 83	1,452 10	2,919 93	1,310 29
Monterey	719 39	18,559 16	19,278 55	27,200 42
Napa	1,187 65	19,437 26	20,624 91	24,595 62
Nevada	612 60	14,634 34	15,246 94	40,003 41
Placer	1,449 68	15,709 20	17,158 88	22,140 80
Plumas	1,591 23	5,027 12	6,618 35	8,074 88
Sacramento	857 21	43,295 56	44,152 77	54,937 60
San Benito	706 57	9,599 61	10,306 18	11,721 60
San Bernardino	744 85	5,859 47	6,604 32	17,610 02
San Diego	441 88	8,625 23	9,067 11	13,363 41
San Francisco		585,883 43	585,883 43	420,004 26
San Joaquin	2,802 24	42,855 34	45,657 58	41,337 38
San Luis Obispo	2,676 82	9,764 21	12,441 03	20,214 82
San Mateo	761 57	15,526 42	16,287 99	19,899 09
Santa Barbara	1,101 10	11,686 22	12,787 32	21,856 64
Santa Clara	219 48	67,288 88	67,508 36	72,437 12
Santa Cruz	707 16	15,728 95	16,436 11	29,394 77
Shasta	432 17	4,611 98	5,044 15	13,323 94
Sierra	381 23	3,811 96	4,193 19	8,958 93
Siskiyou	569 41	6,246 80	6,816 21	14,586 88
Solano	974 66	21,427 87	22,402 53	36,119 89
Sonoma	1,960 52	36,479 35	38,439 87	59,839 36
Stanislaus	1,496 28	12,802 26	14,298 54	13,971 20
Sutter	559 67	9,725 12	10,284 79	12,400 42
Tehama	1,861 19	9,040 95	10,902 14	14,871 04
Trinity	113 14	1,699 41	1,812 55	5,375 36
Tulare	1,717 91	10,440 74	12,158 65	26,474 24
Tuolumne	160 25	3,648 92	3,809 17	14,192 21
Ventura	53 83	6,810 30	6,864 13	10,821 76
Yolo	920 12	30,301 37	31,221 49	24,043 09
Yuba	423 36	13,974 56	14,397 92	19,457 06
Totals	\$62,398 36	\$1,392,476 31	\$1,455,359 00	\$1,579,195 37
Receipts from other sources			124,611 91	
Total receipts of School Fund			\$1,579,970 91	
Total disbursements of School Fund			1,579,195 37	
Balance undistributed for the year ending Feb. 16th, 1878.			\$775 54	

STATEMENT No. 18.

Amount received for school purposes from interest on State school land, and from property tax from the several counties of the State, and from other sources, for the year ending February 18th, 1879, and total amount distributed to the several counties for the same time.

COUNTIES.	Interest on School Lands.	Property Tax.	Total Amount.	Amount Distributed.
Balance from February, 1878. apportionment			\$775 54	
Alameda	\$170 33	\$95,728 18	95,898 51	\$90,200 88
Alpine	276 88	950 18	1,227 06	720 72
Amador	601 38	5,416 72	6,018 10	18,426 87
Butte	385 29	23,393 79	23,779 08	27,512 10
Calaveras	832 72	4,132 67	4,965 39	15,176 70
Colusa	788 18	26,791 50	27,579 68	19,313 91
Contra Costa	756 33	16,488 54	17,244 87	22,813 56
Del Norte		1,518 20	1,518 20	3,173 94
El Dorado	1,124 08	5,143 71	6,267 79	16,375 59
Fresno	3,233 45	13,782 12	17,015 57	14,296 59
Humboldt	2,762 10	11,838 18	14,600 28	25,828 11
Inyo	152 96	2,614 35	2,767 31	2,986 83
Kern	2,401 05	11,490 24	13,891 29	8,475 39
Lake	759 70	4,564 07	5,323 77	11,413 71
Lassen	344 20	2,597 65	2,941 85	5,786 55
Los Angeles	1,863 11	36,002 96	37,866 07	72,390 78
Marin		18,398 18	18,398 18	13,520 43
Mariposa	491 04	2,481 67	2,972 71	6,347 88
Mendocino	3,473 87	12,561 63	16,035 50	23,825 34
Merced	1,719 71	11,191 43	12,911 14	8,128 89
Modoc	199 97	2,348 15	2,548 12	6,846 84
Mono	216 00	1,989 25	2,205 25	1,628 55
Monterey	1,062 47	16,457 17	17,519 64	22,862 07
Napa	832 68	17,913 66	18,746 34	21,760 20
Nevada	332 40	17,717 84	18,050 24	34,989 57
Placer	1,177 35	1,175 64	2,352 99	19,674 27
Plumas	282 37	4,344 93	4,627 30	6,943 86
Sacramento	1,485 10	41,239 95	42,725 05	48,572 37
San Benito	398 18	7,881 06	8,279 24	10,727 64
San Bernardino	579 00	4,776 72	5,355 72	16,777 53
San Diego	587 46	8,353 74	8,941 20	11,649 33
San Francisco		519,765 54	519,765 54	387,380 07
San Joaquin	2,938 63	39,020 14	41,958 77	36,749 79
San Luis Obispo	2,637 21	9,706 48	12,343 69	18,191 25
San Mateo	549 95	13,777 96	14,327 91	16,742 88
Santa Barbara	1,604 72	9,588 55	11,193 27	19,695 06
Santa Clara	249 12	61,168 23	61,417 35	65,876 58
Santa Cruz	158 95	14,002 19	14,161 14	25,668 72
Shasta	355 26	4,137 47	4,492 73	13,485 78
Sierra	1,145 01	6,631 71	7,776 72	8,198 19
Siskiyou	740 70	5,486 92	6,227 62	13,139 28
Solano	1,251 92	19,642 11	20,894 03	31,614 66
Sonoma	965 06	41,841 81	42,806 87	52,189 83
Stanislaus	1,490 78	12,331 96	13,822 74	11,739 42
Sutter	68 11	8,738 55	8,806 66	11,171 16
Tehama	1,502 34	8,879 04	10,381 38	13,700 61
Trinity	221 17	1,833 80	2,054 97	4,857 93
Tulare	1,783 40	11,746 43	13,529 83	23,534 28
Tuolumne	190 64	3,560 53	3,751 17	12,515 58
Ventura	36 14	7,501 76	7,537 90	9,999 99
Yolo	947 83	22,879 14	23,826 97	20,970 18
Yuba	334 64	9,123 11	9,457 75	17,373 51
Totals	\$48,460 94	\$1,262,647 51	\$1,311,883 99	\$1,423,941 75
Receipts from other sources			114,071 55	
Total receipts of School Fund			\$1,425,955 54	
Total disbursements of School Fund			1,423,941 75	
Undistributed balance for the year ending Feb. 18th, 1879			\$2,013 79	

VALUATION OF PROPERTY FROM 1850 TO 1879.

STATEMENT No. 19.

The valuation of real and personal property, and the rate of taxation on each one hundred dollars, from the organization of the State Government to the year 1878-9.

YEAR.	Assessed Value of Property.	Tax for State Purposes.
1850-1	\$57,670,689 00	50
1851-2	49,231,052 00	65
1852-3	64,579,375 00	65
1853-4	95,335,646 00	60
1854-5	111,191,630 00	60
1855-6	103,887,193 55	60
1856-7	95,007,440 97	70
1857-8	126,059,461 82	70
1858-9	123,955,877 00	60
1859-60	131,060,279 49	60
1860-1	148,193,540 02	60
1861-2	147,811,617 16	60
1862-3	160,369,071 81	77
1863-4	174,104,955 07	92
1864-5	180,484,949 85	\$1 25
1865-6	183,509,161 00	1 15
1866-7	200,764,135 50	1 13
1867-8	212,205,339 01	1 13
1868-9	237,483,175 07	1 00
1869-70	260,563,886 08	97
1870-1	277,538,134 97	86.5
1871-2	267,868,126 76	86.5
1872-3	637,232,823 31	50
1873-4	528,747,043 00	50
1874-5	611,495,197 00	64.9
1875-6	618,083,315 00	60.5
1876-7	595,073,177 00	73.5
1877-8	586,953,022 00	63
1878-9	584,578,036 00	55

STATEMENT

OF THE

Condition of Estates of Deceased Persons, June 30th, 1879.

CONTINUED FROM BIENNIAL REPORT 1875-7.

STATEMENT No. 20.

STATE OF CALIFORNIA IN ACCOUNT WITH ESTATES OF DECEASED PERSONS.

Dr.

Showing the amounts paid into the State Treasury by County Treasurers and Administrators, from estates of deceased persons; also, the amounts paid to the heirs by the State Treasurer, according to law. Continued from Biennial Report of 1875-7.

Date.	ESTATE OF—	From whom Received.	Fund.	Amount.
1877.				
October 5	Joseph L. Folsom	A. C. Peachy, Executor	Estates of Deceased Persons	\$964 26
October 30	J. A. Robinson	C. Hubert, Treasurer of San Francisco	Estates of Deceased Persons	137 09
October 30	Alexander Macht	C. Hubert, Treasurer of San Francisco	Estates of Deceased Persons	39 53
1878.				
January 22	Timothy Darcy	Treasurer of Lassen County	Estates of Deceased Persons	2 10
January 23	John Hanly	Treasurer of Solano County	Estates of Deceased Persons	249 06
February 5	Mike McCabe	Treasurer of Los Angeles County	Estates of Deceased Persons	10 00
February 5 ^a		Treasurer of Los Angeles County	Estates of Deceased Persons	30 00
February 26	Samuel Ward	Treasurer of Sierra County	Estates of Deceased Persons	27 15
April 19	Sundry persons, 235 estates, consisting of \$1,557 16, of which \$39 28 is legal tender notes; there is also a box of personal effects, etc., belonging to these estates, stored in the State treasury vaults			
April 26	W. S. Jones	C. Hubert, Treasurer of San Francisco	Estates of Deceased Persons	1,557 16
April 26	Daniel Taylor	Treasurer of Humboldt County	Estates of Deceased Persons	100 00
April 26	Abraham Casey	Treasurer of Humboldt County	Estates of Deceased Persons	4 63
July 1	D. Sullivan	Treasurer of Humboldt County	Estates of Deceased Persons	5 84
October 21	Henry Hammill	Treasurer of Santa Cruz County	Estates of Deceased Persons	4 65
		C. Hubert, Treasurer of San Francisco	Estates of Deceased Persons	30
1879.				
January 25	John Allen	Treasurer of Los Angeles County	Estates of Deceased Persons	30 00
January 29	John Myers	P. Dunlap, Attorney for State	Estates of Deceased Persons	825 00
February 4	W. Banks	Treasurer of Kern County	Estates of Deceased Persons	59 24

* No record of the name of this estate in the County Treasurer's office.

STATE OF CALIFORNIA IN ACCOUNT WITH ESTATES OF DECEASED PERSONS—Continued.

Cr.

Date.	Estate of—	To Whom Paid.	Warrant.	Fund.	Amount.
1878.					
April 17 -----	Joseph L. Folsom -----	Main & Winchester -----	6,191	Estates of Deceased Persons -----	\$29 31
May 21 -----	Sundry persons, commissions according to law on \$1,557 16 -----	A. W. Roydsdon, Attorney for State ----- Counsel fees -----	6,479 6,480	Estates of Deceased Persons -----	*149 79
August 1 -----	Joseph L. Folsom -----	James Fitton, Assignee ----- Catherine Keating ----- Henry Sharvin ----- Edward Sharvin ----- Catherine Flannery ----- James Sharvin ----- Hugh Sharvin ----- Mary Sharvin ----- Sarah Trainor ----- Clerk of Sacramento County, "fees" -----	473 988 990 991 992 993 994 995 996	Estates of Deceased Persons ----- Estates of Deceased Persons ----- Estates of Deceased Persons ----- Estates of Deceased Persons ----- Estates of Deceased Persons ----- Estates of Deceased Persons ----- Estates of Deceased Persons ----- Estates of Deceased Persons ----- Estates of Deceased Persons -----	581 88 247 79 247 79 247 79 247 79 247 79 247 80 247 80 17 35
September 5 -----	P. Sharvin -----	Heirs at law. -----			
1879.					
February 13 -----	John Myers -----	P. Dunlap, Attorney for State, counsel fees. -----	5,635	Estates of Deceased Persons -----	82 50

* Coin.

† "Legal tender."

STATEMENTS

OF

CONTINGENT EXPENSES OF THE SENATE AND ASSEMBLY

FOR THE

18th, 19th, 20th, 21st, and 22d Sessions.

STATEMENT No. 21.

Contingent expenses of Senate, 18th, 19th, 20th, 21st, and 22d Sessions.

FOR WHAT PURPOSE EXPENDED.	Amount, 18th Session.	Amount, 19th Session.	Amount, 20th Session.	Amount, 21st Session.	Amount, 22d Session.
Arrests.....	\$166 00	\$19 00			\$14 00
Banquet to Japanese Commissioners.....		1,000 00			
Brushes.....	4 50				
Burial expenses of W. Burnett and R. T. Sprague.....		737 77			
Burial expenses of Jas. W. Maudeville.....				\$204 25	
Carrying mail.....		100 00			
Carpenter work.....	79 50	80 00		84 54	366 00
Carpets.....	204 75	277 36			
Chaplain.....	600 00	585 00	\$600 00	50 00	
Chinese Investigating Committee:					
Photographic Reporter.....				1,000 00	
Sergeant-at-Arms.....				250 00	
Postage and engraving.....				590 01	515 00
Mileage.....					2,585 60
Commissioners contested election, Murphy vs. Pacheco.....	546 00				
Commissioners to examine books of State officers.....	2,250 00				
Contested election of Senator Beck.....		1,500 00	639 00		
Contested election, Gildea vs. Fraser.....					
Contested election, Ward vs. Montgomery*.....		1,957 04	286 99	1,188 75	
Copying Journals and Appendices.....	2,136 50			40 00	
Correcting Senate Journals.....					
Crockery.....	47 50	44 50			
Codes, purchase of.....					
Drayage and expressage.....		65 00	8 50		675 00
Delivering Journals to Secretary of State.....				100 00	
Exporting.....				240 00	
Extra Clerk hire.....	18,430 00	236 00		12,183 00	9,522 00
Extra pay voted Clerks and Attachés.....	1,260 00	19,250 77	10,411 29	654 00	416 00
Extra Pages.....	1,005 00		630 00	348 00	714 00
Fireman and Door-keeper.....	836 00	1,005 00	321 00	436 00	480 00
Engrossing, per folio.....		936 00			2,459 85
Enrolling, per folio.....					2,006 00
Furniture.....	469 30	927 50	25 50	51 50	

Fuel and ice.....	73 01	74 50	86 75	60 90	66 20
Funeral decorations.....		152 98	21 18		29 60
Gas and gas-fixtures.....		177 50		75 00	
Hack hire.....	54 25	371 75	92 75	88 75	
Keys and locks.....		25 00			
Legal opinion.....	10 00			8 00	
Mail-bag.....		416 00	475 00	218 00	
Mail-carrier.....	10 00				
Matches and brooms.....	376 00	1,107 00			400 00
Messenger and Paper-folders.....	1,467 20	1,826 75	1,523 20	2,333 50	1,880 15
Mileage of committees.....	46 80				
Mileage of Messengers.....					
Music at Governor's inauguration.....					696 00
Messenger for Committee on Printing.....	2,241 72	2,017 84		50 00	943 05
Newspapers.....	190 00				120 00
Overseer of gas-fixtures.....	20 00			4 00	2 25
Painting signs.....	200 00	420 00	610 84	284 80	281 40
Phonographic Reporter.....	1,846 00	1,662 00	472 00	482 00	931 75
Porters.....		700 00			
Portrait of ex-Governor Bigler.....	805 00	1,261 24	733 15		908 50
Postage and expressage.....		100 00			
Repairing clock.....		20 00			
Repairing safe.....	926 66	270 00			
Room rent for committees.....					380 00
Reporting Senate bills.....	2,277 19				
Sergeant-at-Arms, no bill rendered.....	5 00				
Sponges.....		332 00			
Stationery.....	165 95	57 75			48 00
Stoves.....	212 00		40 00	430 50	34 25
Subpening witnesses and witness fees.....			37 50	11 00	25 25
Sundries.....		8 75			132 65
Telegraphing.....	1,477 00	1,440 00	391 05	33 00	
Temporary officers and attaches.....	27 05		24 00	12 50	
Towels and soap.....					
Translating Governor's inaugural address.....	10 88				
Tubs, pails, and mops.....					27 50
Translating.....		36 00	25 00	8 00	30 00
Washing.....	488 00	708 00	668 00	480 00	720 00
Watchmen.....					
Totals.....	\$40,981 75	\$42,000 00	\$18,142 70	\$22,000 00	\$27,500 00

* \$500 of this amount was returned and paid into the State treasury by J. M. Montgomery.

STATEMENT No. 22.

Contingent expenses of Assembly, 18th, 19th, 20th, 21st, and 22d Sessions.

FOR WHAT PURPOSE EXPENDED.	Amount, 18th Session.	Amount, 19th Session.	Amount, 20th Session.	Amount, 21st Session.	Amount, 22d Session.
Books.....		\$299 50			
Burial expenses of Royal T. Sprague.....		237 77			
Burial expenses of James W. Maudeville.....				\$204 25	
Banquet to Japanese Commissioners.....		1,000 00			
Box rent at Post-office.....		300 00	\$282 50	353 00	\$10 00
Carrying mail.....		92 31		37 68	299 50
Carpenter work.....	\$305 75				18 50
Chemicals.....					50
Certifying mortgage of G. C. H. Association.....					
Chaplain.....	600 00	600 00	292 00	33 00	560 00
Cleaning carpets.....	15 02			340 00	
Cleaning globes.....				30 00	
Contested election expenses.....			1,311 00	497 50	
Contested election expenses, Hopper vs. Biggs.....				222 05	
Contested election expenses of F. A. Pullen.....				97 00	
Copying Journal and Appendices.....	2,452 70		1,068 54	284 75	
Delivering books and papers to Secretary of State.....		100 00		74 00	
Drayage and expressage.....	174 50	105 15		3 30	35
Expenses of investigations.....			7,414 30		
Experting for Committee on Public Buildings.....		125 70			
Extra Clerk hire.....	18,385 20	24,888 90	10,640 46	12,513 80	6,534 00
Extra pay voted Clerks and Attachés.....	6,588 80	2,942 00	296 00	265 00	
Enrolling, per folio.....					2,113 33
Engrossing, per folio.....					1,141 11
Expert.....					20 00
Fireman and Door-keepers.....	440 00	1,384 00			
Fuel and coal oil.....	8 25	20 75			
Furniture.....	1,014 74	1,698 23	46 00		
Funeral decorations.....					32 50
Gas-fixtures and gas.....	210 40	137 06			
Glassware and crockery.....	70 42	80 50			
Hack hire.....		177 50		75 00	
Hardware and rope.....	34 38				
Ice and water coolers.....		152 95	43 00	51 00	71 70

Legal opinion	25 00				
Locks and keys	430 00	83 25		85 00	
Mail-bag and carpet-sweepers	75 00	15 00		3 00	62 00
Matches, sponges, brooms, soap, and combs	61 00			50 00	
Making diagrams					267 00
Messengers	150 50				3,848 00
Mileage of committees	2,499 30	1,337 10		2,451 87	193 50
Mileage of Sergeant-at-Arms, serving summons	3,221 30			849 55	
Mileage of Sergeant-at-Arms of committees	359 00				
Mileage of Music for inauguration of Governor	155 90			50 00	
Newspapers	5,128 19	2,615 17		2,464 41	2,213 03
Overseer of gas-fixtures	190 00				75 00
Painting signs	61 00				
Pages	1,416 00			42 00	351 00
Photographic Reporter	100 00			812 80	2,130 80
Porters	1,954 00	137 00		34 00	332 00
Postage stamps	956 40	1,635 50		1,233 51	1,305 10
Printing	70 50			400 00	1,200 00
Purchase of Codes					
Rent of committee-rooms	710 00				50 00
Repairing clock		35 00		70 62	450 00
Repairing furniture					
Relief of Mary H. Ludgate					
Safe					
Scissors, baskets, and tin-cups	163 62				
Serving subpoenas and telegrams	105 00				
Slates and pencils	1,643 07			36 72	
Stationery	157 50				
Stoves	90 00				
Sundries				12 25	
Stenographic Reporter G. G. P. A. Investigating Committee		43 50		427 20	
Temporary officers and attachés	1,484 40	375 00		476 50	378 20
Towels and washing	25 59			7 17	
Translation of Governor's message (address)	70 70			12 50	
Transcribing testimony					211 00
Translating					27 50
Watchman	944 00	1,017 00		1,029 00	1,053 00
Witness fees and mileage				292 50	165 50
Whitewashing				6 50	
Wash-basins	51 50				
Totals	\$48,777 93	\$53,014 07	\$28,687 32	\$25,930 43	\$25,114 12



Estimates of Expenditures for the 32d and 33d Fiscal Years.

STATEMENT No. 23.

Estimate of expenditures for the 32d and 33d fiscal years, ending June 30th, 1882.

FOR WHAT PURPOSE.	Amount.	Total.
Per diem and mileage of Lieutenant-Governor and Senators ..	\$21,000 00	-----
Per diem and mileage of Assemblymen	41,000 00	-----
Pay of Officers and Clerks of Senate	6,000 00	-----
Pay of Officers and Clerks of Assembly	6,500 00	-----
Contingent expenses of Senate	8,500 00	-----
Contingent expenses of Assembly	12,000 00	-----
Total for Legislative Department		\$95,000 00
Salaries of Chief and Associate Justices of Supreme Court	\$84,000 00	-----
Salaries of Superior Judges	231,000 00	-----
Salary of Clerk of Supreme Court	8,000 00	-----
Salaries of Deputy Clerks of Supreme Court	10,800 00	-----
Salary of Reporter of Supreme Court	5,000 00	-----
Salary of Phonographic Reporter of Supreme Court	6,000 00	-----
Salary of Secretary to Justices of Supreme Court	6,000 00	-----
Salary of Bailiff and Porter of Supreme Court	2,400 00	-----
Salary of Porter for office of Clerk of Supreme Court	400 00	-----
Postage and contingent expenses of Supreme Court	500 00	-----
Postage and contingent expenses of Clerk of Supreme Court	500 00	-----
Expenditures of Supreme Court under Section 51, Code of Civil Procedure	30,000 00	-----
Total for Judicial Department		384,600 00
Salary of Governor	\$12,000 00	-----
Salary of Private Secretary	4,800 00	-----
Salary of Executive Clerk	3,200 00	-----
Salary of Porter	1,200 00	-----
Special contingent (seeret service)	5,000 00	-----
Postage, expressage, telegraphing, etc.	1,000 00	-----
Total for Governor's office		27,200 00
Salary of Secretary of State	\$6,000 00	-----
Salary of Deputy Secretary of State	4,800 00	-----
Salary of Book-keeper	4,800 00	-----
Salary of Clerks	6,400 00	-----
Salary of Porter	300 00	-----
Postage, expressage, and telegraphing	2,800 00	-----
Contingent expenses	200 00	-----
Total for Secretary of State's office		25,300 00
Salary of Controller	\$6,000 00	-----
Salary of Deputy Controller	4,800 00	-----
Salary of Book-keeper	4,800 00	-----
Salary of Clerks	9,600 00	-----
Salary of Porter	600 00	-----
Contingent expenses	200 00	-----
Postage, expressage, and telegraphing	500 00	-----
Total for Controller's office		26,500 00
Salary of Treasurer	\$6,000 00	-----
Salary of Deputy	4,800 00	-----
Salary of Clerk	3,200 00	-----
Salary of Watchmen	4,800 00	-----
Salary of Porter	300 00	-----
Postage and expressage, etc.	300 00	-----
Total for Treasurer's office		19,400 00
Amount carried forward		\$578,000 00

ESTIMATE OF EXPENDITURES—Continued.

FOR WHAT PURPOSE.	AMOUNT.	TOTAL.
Amount brought forward		\$578,000 00
Salary of Attorney-General	\$6,000 00	
Salary of Clerk	3,200 00	
Salary of Porter	200 00	
Postage, expressage, etc.	200 00	
Costs and expenses of suits wherein the State is party in interest ..	8,000 00	
Total for Attorney-General's office		17,600 00
Salary of Surveyor-General	\$3,000 00	
Salary of Deputy	4,800 00	
Salary of Clerk	3,200 00	
Salary of Porter	600 00	
Postage, expressage, etc.	250 00	
Purchase of maps	400 00	
Copying maps	300 00	
Total for Surveyor-General's office		12,550 00
Salary of Register of Land Office	\$3,000 00	
Salary of Clerk	3,200 00	
Postage, expressage, etc.	550 00	
Total for State Land Office		6,750 00
Salary of Superintendent of Public Instruction	\$6,000 00	
Salary of Deputy	3,600 00	
Salary of Porter	400 00	
Contingent expenses	200 00	
Postage and expressage	1,600 00	
Traveling expenses	3,000 00	
Total for Superintendent of Public Instruction's office		14,800 00
Salary of State Librarian	\$6,000 00	
Salary of Deputies	7,200 00	
Salary of Porter	1,800 00	
Postage and expressage	400 00	
Total for State Library		15,400 00
Salary of Adjutant-General	\$6,000 00	
Salary of Assistant Adjutant-General	3,600 00	
Salary of Porter	600 00	
Postage and expressage	200 00	
Cleaning and transportation of arms and traveling and contin- gent expenses	1,500 00	
Armory rents, etc., National Guard	99,528 00	
Total for military purposes		111,428 00
Salary of Insurance Commissioner	\$6,000 00	
Salary of Clerk	3,600 00	
Rent, printing, and contingent expenses	5,000 00	
Total for Insurance Commissioner's office		14,600 00
Salary of Secretary State Board of Health	\$5,000 00	
Mileage and contingent expenses State Board of Health	2,000 00	
Total for State Board of Health		7,000 00
Amount carried forward		\$778,128 00

ESTIMATE OF EXPENDITURES—Continued.

FOR WHAT PURPOSE.	Amount.	Total.
Amount brought forward		\$778,128 00
Salary of Superintendent of State Printing Office.....	\$4,800 00	
Support of State Printing Office.....	100,000 00	
Total for State Printing Office		104,800 00
Support of California Asylum for Insane, Stockton	\$384,000 00	
Support of Napa Branch Asylum for Insane, Napa.....	240,000 00	
Transportation of insane.....	50,000 00	
Total for Insane Asylums.....		674,000 00
Support of State Prison, San Quentin	\$300,000 00	
Transportation of prisoners.....	55,000 00	
Total for State Prison.....		355,000 00
Pay of employes of Capitol building and grounds.....	\$28,800 00	
Purchase of water, hose, and implements for use in the State Capitol building and grounds	5,000 00	
Repairs to State Capitol building and furniture	2,000 00	
Payment of interest to Hastings College of Law	14,000 00	
Purchase of ballot paper	10,000 00	
Purchase of Supreme Court Reports.....	5,400 00	
Payment of rewards offered by Governor	4,000 00	
Arresting criminals without the limits of the State	5,000 00	
Traveling expenses of Surveyor and Attorney-Generals	1,000 00	
Services of State Board of Examination	1,600 00	
Traveling expenses of State Board of Education	600 00	
Support of State Normal School.....	66,600 00	
Education and care of the indigent deaf, dumb, and blind	72,000 00	
Official advertisements.....	5,000 00	
Restoration and preservation of fish.....	10,000 00	
Stationery, fuel, and light.....	25,000 00	
Rewards for arrest and conviction of highway robbers	12,000 00	
Services of Registers and Receivers of United States Land Office	3,000 00	
Support of orphans.....	200,000 00	
Pay of Presidential Electors	250 00	
Salary of Clerk of State Board of Examiners	2,400 00	
Total miscellaneous		473,650 00
Interest on bonds	\$629,490 00	629,490 00
Support of common schools.....	3,029,656 00	3,029,656 00
Salaries of Railroad Commissioners *		
Salary of Clerk to Railroad Commissioners		
Postage, expressage, and contingent expenses of Railroad Commissioners.....		
Salaries of members of State Board of Equalization *		
Salary of Clerk to State Board of Equalization		
Postage, expressage, and contingent expenses of State Board of Equalization		
Traveling expenses of members and Clerk of State Board of Equalization		
Total		\$6,044,724 00

* Salaries and expenses of these offices to be fixed and provided for by statute.

BIENNIAL REPORT

OF THE

TREASURER OF CALIFORNIA,

FOR THE

TWENTY-NINTH AND THIRTIETH FISCAL YEARS.

July 1st, 1877, to June 30th, 1879.



REPORT.

STATE OF CALIFORNIA, TREASURY DEPARTMENT, }
SACRAMENTO, June 30th, 1879. }

His Excellency, Governor William Irwin.

SIR: In compliance with Section 332, Political Code of the State, I respectfully submit my report of the financial transactions of the State during the 29th and 30th fiscal years, commencing July 1st, 1877, and ending June 30th, 1879, embracing its receipts, disbursements, and debt, and containing the following exhibits, showing the condition of the several funds of the State, and the transactions of this department:

First—Receipts from County Treasurers.

Second—Receipts from other sources.

Third—Disbursements.

Fourth—Transactions in each fund.

Fifth—Recapitulation—balance in all the funds.

Sixth—Transactions in State bonds.

Seventh—Bonds held in trust for School Fund.

Eighth—Bonds held in trust for University Fund.

Ninth—State debt, and kind of money in the treasury.

Tenth—Interest and coupon account.

Very respectfully, your obedient servant,

JOSÉ G. ESTUDILLO,
State Treasurer.

RECEIPTS INTO THE STATE TREASURY.

RECEIPTS.	29th Fiscal Year.	30th Fiscal Year.	Total.
<i>From County Treasurers.</i>			
Alameda.....	\$244,856 32	\$226,205 09	\$471,061 41
Alpine.....	2,960 12	2,156 10	5,116 22
Amador.....	15,042 64	13,345 34	28,387 98
Butte.....	63,980 24	55,796 94	119,777 18
Calaveras.....	14,004 63	11,850 04	25,854 67
Colusa.....	74,230 08	64,495 68	138,725 76
Contra Costa.....	41,340 51	41,482 99	82,823 50
Del Norte.....	3,621 70	3,651 82	7,273 52
El Dorado.....	15,958 74	14,531 49	30,490 23
Fresno.....	36,601 63	39,473 30	76,074 93
Humboldt.....	33,695 31	34,766 26	68,461 57
Inyo.....	8,263 42	6,815 18	15,078 60
Kern.....	28,859 65	38,174 71	67,034 36
Lake.....	14,806 98	12,619 63	27,426 61
Lassen.....	11,430 77	7,720 75	19,151 52
Los Angeles.....	94,180 63	87,204 29	181,384 92
Marin.....	51,155 97	41,119 08	92,275 05
Mariposa.....	8,393 58	7,204 69	15,598 27
Mendocino.....	49,700 01	34,983 05	84,683 06
Merced.....	27,857 05	36,021 96	63,879 01
Modoc.....	6,494 12	7,087 41	13,581 53
Mono.....	4,582 84	6,674 66	11,257 50
Monterey.....	49,684 41	36,894 32	86,578 73
Napa.....	49,407 86	39,342 91	88,750 77
Nevada.....	42,619 11	36,591 96	79,211 07
Placer.....	34,658 16	30,729 03	65,387 19
Plumas.....	13,980 34	11,917 52	25,897 86
Sacramento.....	107,479 26	99,324 29	206,803 55
San Benito.....	23,512 27	21,439 86	44,952 13
San Bernardino.....	12,783 35	13,907 60	26,690 95
San Diego.....	23,829 15	20,012 20	43,841 35
San Francisco.....	1,407,483 33	1,255,338 12	2,662,821 45
San Joaquin.....	108,941 56	98,630 21	207,571 77
San Luis Obispo.....	34,448 31	26,028 53	60,476 84
San Mateo.....	39,144 54	32,690 99	71,835 53
Santa Barbara.....	24,224 47	28,113 77	52,338 24
Santa Clara.....	168,828 70	145,229 43	314,058 13
Santa Cruz.....	42,567 25	33,321 65	75,888 90
Shasta.....	12,571 28	10,513 81	23,085 09
Sierra.....	9,983 00	7,741 07	17,724 07
Siskiyou.....	16,471 69	15,291 06	31,762 75
Solano.....	54,507 77	54,336 16	108,843 93
Sonoma.....	98,474 05	82,765 94	181,239 99
Stanislaus.....	31,744 32	39,776 17	71,520 49
Sutter.....	30,759 60	37,489 64	68,249 24
Tehama.....	24,017 33	25,599 68	49,617 01
Trinity.....	5,460 16	4,077 55	9,537 71
Tulare.....	23,177 00	34,725 13	57,902 13
Tuolumne.....	9,581 74	8,165 10	17,746 84
Ventura.....	15,521 89	21,053 21	36,575 10
Yolo.....	68,399 49	79,957 80	148,357 29
Yuba.....	25,990 62	22,742 72	48,733 34
Totals carried forward.....	\$3,462,268 95	\$3,167,127 89	\$6,629,396 84

RECEIPTS—Continued.

RECEIPTS.	29th Fiscal Year.	30th Fiscal Year.	Total.
Brought forward	\$3,462,268 95	\$3,167,127 89	\$6,629,396 84
<i>From other sources.</i>			
Clerk of the Supreme Court	6,431 30	10,008 65	16,439 95
Secretary of State, fees in office	11,632 00	10,853 75	22,485 75
Secretary of State, sale Geological Report	5 00	95 00	100 00
Secretary of State, sale Statutes and Amendments to Codes	6 00	-----	6 00
Secretary of State, sale Supreme Court Reports	12 00	15 00	27 00
Secretary of State, sale ballot paper	4,145 86	616 30	4,762 16
Secretary of State, sale of Codes	12 50	17 50	30 00
Secretary of State, sale old carpet, etc.	119 75	-----	119 75
Secretary of State, sale marble mantel	-----	5 00	5 00
Secretary of State, sale Statutes 1877-8	-----	89 00	89 00
Secretary of State, sale bound volume Constitution United States and California	-----	1 00	1 00
Surveyor-General, fees in office	5,869 95	3,285 00	9,154 95
Register State Land Office	2,931 50	2,005 00	4,936 50
Insurance Commissioner	12,173 42	12,492 74	24,666 16
Harbor Commissioners	284,345 06	281,531 43	565,876 49
Commissioner Immigration	404 00	42 40	446 40
State Treasurer, interest on State bonds held in trust for School Fund	107,760 00	107,760 00	215,520 00
State Treasurer, interest on county bonds held in trust for School Fund	13,831 50	17,134 70	30,966 20
State Treasurer, interest on State bonds held in trust for University Fund	50,040 00	58,500 00	108,540 00
State Treasurer, interest on county bonds held in trust for University Fund	-----	16,545 04	16,545 04
State Capitol Commissioners	256 00	-----	256 00
Regents State University	85 40	215 25	300 65
A. C. Peachy, Executor of estate Jos. L. Folsom, deceased	964 26	-----	964 26
S. C. Hastings	100,000 00	-----	100,000 00
L. C. Wittenmeyer	8,000 00	-----	8,000 00
Bank Commissioners	-----	13,913 60	13,913 60
W. B. C. Brown	-----	5,768 52	5,768 52
P. Dunlap	-----	825 00	825 00
J. M. Ward, Jr.	-----	1,023 00	1,023 00
Totals	\$4,071,294 45	\$3,709,870 77	\$7,781,165 22
Balance on hand July 1st, 1877	-----	-----	1,408,117 43
Grand total	-----	-----	\$9,189,282 65

DISBURSEMENTS.

FOR WHAT PURPOSE.	29th Fiscal Year.	30th Fiscal Year.	Total.
Paid Controller's warrants	\$3,878,687 12	\$3,812,144 98	\$7,690,832 10
Balance in treasury June 30th, 1879	-----	-----	1,498,450 55
Total	-----	-----	\$9,189,282 65

GENERAL FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$403,529 49	-----
From County Treasurers, 29th fiscal year	1,663,230 09	-----
From County Treasurers, 30th fiscal year	1,392,793 84	-----
From Clerk of Supreme Court, 29th fiscal year	5,145 04	-----
From Clerk of Supreme Court, 30th fiscal year	8,006 92	-----
From Secretary of State, 29th fiscal year	3,881 53	-----
From Secretary of State, 30th fiscal year	682 17	-----
From Surveyor-General, 29th fiscal year	5,869 95	-----
From Surveyor-General, 30th fiscal year	3,285 00	-----
From Register of State Land Office, 29th fiscal year	2,931 50	-----
From Register of State Land Office, 30th fiscal year	2,005 00	-----
From Insurance Commissioner, 29th fiscal year	12,173 42	-----
From Insurance Commissioner, 30th fiscal year	12,492 74	-----
From Commissioner of Immigration, 29th fiscal year	404 00	-----
From Commissioner of Immigration, 30th fiscal year	42 40	-----
From Capitol Commissioners, 29th fiscal year	30 00	-----
From Bank Commissioners, 30th fiscal year	13,913 60	-----
From S. C. Hastings, 29th fiscal year	100,000 00	-----
From W. B. C. Brown, 30th fiscal year	4,385 68	-----
Transfer from Folsom Branch State Prison Fund, 29th fiscal year	85,194 73	-----
Transfer from Folsom Branch State Prison Fund, 30th fiscal year	50,000 00	-----
Transfer from Insane Asylum Special Fund, 29th fiscal year	24,474 25	-----
Transfer from Insane Asylum Special Fund, 29th fiscal year	24,474 25	-----
Transfer from State Capitol Fund, 29th fiscal year	150 75	-----
Transfer from Military Fund, 29th fiscal year	109 37	-----
Transfer from Normal School Building Fund, 29th fiscal year	10 24	-----
Transfer from Interest and Sinking Fund, 30th fiscal year	88,000 00	-----
Transfer from San Francisco Harbor Improvement Fund, 30th fiscal year	300,000 00	-----
Paid Controller's warrants, 29th fiscal year	-----	\$1,656,141 07
Paid Controller's warrants, 30th fiscal year	-----	1,543,082 44
Transfer to Folsom Branch State Prison Fund, 29th fiscal year	-----	85,194 73
Transfer to Folsom Branch State Prison Fund, 30th fiscal year	-----	50,000 00
Transfer to Insane Asylum Special Fund, 29th fiscal year	-----	24,474 25
Transfer to San Francisco Harbor Improvement Fund, 30th fiscal year	-----	300,000 00
Transfer to Interest and Sinking Fund, 30th fiscal year	-----	88,000 00
Balance on hand June 30th, 1879	-----	460,323 47
Totals	\$4,207,215 96	\$4,207,215 96

SCHOOL FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$220,049 95	-----
From County Treasurers, 29th fiscal year	1,394,358 22	-----
From County Treasurers, 30th fiscal year	1,326,612 09	-----
From interest on State bonds, 29th fiscal year	107,760 00	-----
From interest on State bonds, 30th fiscal year	107,760 00	-----
From interest on county bonds, 29th fiscal year	13,831 50	-----
From interest on county bonds, 30th fiscal year	17,134 70	-----
From Regents State University, 29th fiscal year	85 40	-----
From Regents State University, 30th fiscal year	215 25	-----
From W. B. C. Brown, 30th fiscal year	562 37	-----
From Secretary of State, 29th fiscal year	5 00	-----
From Secretary of State, 30th fiscal year	95 00	-----
Paid Controller's warrants, 29th fiscal year	-----	\$1,571,485 89
Paid Controller's warrants, 30th fiscal year	-----	1,426,703 35
Balance on hand June 30th, 1879	-----	190,280 24
Totals	\$3,188,469 48	\$3,188,469 48

INTEREST AND SINKING FUND.

	Receipts	Payments.
July 1st, 1877—Balance on hand	\$249,311 07	-----
From County Treasurers, 29th fiscal year	310,801 85	-----
From County Treasurers, 30th fiscal year	330,568 31	-----
From transfer from General Fund, 30th fiscal year	88,000 00	-----
From W. B. C. Brown, 30th fiscal year	820 47	-----
Transferred to General Fund, 30th fiscal year	-----	\$88,600 00
Paid Controller's warrants, 29th fiscal year	-----	322,997 73
Paid Controller's warrants, 30th fiscal year	-----	314,745 00
Balance on hand June 30th, 1879	-----	253,758 97
Totals	\$979,501 70	\$979,501 70

STATE CAPITOL FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$267 10	-----
From Capitol Commissioners, 29th fiscal year	226 00	-----
Paid Controller's warrants, 29th fiscal year	-----	\$342 35
Transferred to General Fund	-----	150 75
Totals	\$493 10	\$493 10

MILITARY FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$109 37	-----
Transferred to General Fund, 29th fiscal year	-----	\$109 37
Totals	\$109 37	\$109 37

STATE NORMAL SCHOOL BUILDING FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$10 24	-----
Transferred to General Fund, 29th fiscal year	-----	\$10 24
Totals	\$10 24	\$10 24

STATE SCHOOL LAND FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$69,948 78	-----
From County Treasurers, 29th fiscal year	80,841 01	-----
From County Treasurers, 30th fiscal year	73,383 14	-----
Paid Controller's warrants, 29th fiscal year	-----	\$81,386 67
Paid Controller's warrants, 30th fiscal year	-----	104,902 23
Balance on hand June 30th, 1879	-----	37,884 03
Totals	\$224,172 93	\$224,172 93

STATE UNIVERSITY FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$577 27	-----
From interest on State bonds held in trust, 29th fiscal year -----	50,040 00	-----
From interest on State bonds held in trust, 30th fiscal year -----	58,500 00	-----
From interest on county bonds held in trust, 30th fiscal year -----	16,545 04	-----
Paid Controller's warrants, 29th fiscal year -----	-----	\$50,617 27
Paid Controller's warrants, 30th fiscal year -----	-----	75,045 04
Totals -----	\$125,662 31	\$125,662 31

STATE LIBRARY FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$1,341 08	-----
From Secretary of State, 29th fiscal year -----	11,632 00	-----
From Secretary of State, 30th fiscal year -----	10,853 75	-----
Paid Controller's warrants, 29th fiscal year -----	-----	\$5,287 63
Paid Controller's warrants, 30th fiscal year -----	-----	10,772 89
Balance on hand June 30th, 1879 -----	-----	7,766 31
Totals -----	\$23,826 83	\$23,826 83

SUPREME COURT LIBRARY FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$3,127 40	-----
From Clerk of Supreme Court, 29th fiscal year -----	1,286 26	-----
From Clerk of Supreme Court, 30th fiscal year -----	2,001 73	-----
Paid Controller's warrants, 29th fiscal year -----	-----	\$2,274 10
Paid Controller's warrants, 30th fiscal year -----	-----	1,513 70
Balance on hand June 30th, 1879 -----	-----	2,627 59
Totals -----	\$6,415 39	\$6,415 39

INSANE ASYLUM SPECIAL FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$24,474 25	-----
From transfer from General Fund, 29th fiscal year -----	24,474 25	-----
Transfer to General Fund, 29th fiscal year -----	-----	\$24,474 25
Transfer to General Fund, 29th fiscal year -----	-----	24,474 25
Totals -----	\$48,948 50	\$48,948 50

SWAMP LAND FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$1,683 36	-----
Paid Controller's warrants, 29th fiscal year -----	-----	\$1,683 36
Totals -----	\$1,683 36	\$1,683 36

WAR BOND FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$8,595 76	-----
Balance on hand June 30th, 1879	-----	\$8,595 76
Totals	\$8,595 76	\$8,595 76

ELECTION REWARD FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$1,201 21	-----
From Secretary of State, 29th fiscal year	414 58	-----
From Secretary of State, 30th fiscal year	61 63	-----
Balance on hand June 30th, 1879	-----	\$1,677 42
Totals	\$1,677 42	\$1,677 42

SWAMP LAND DISTRICT No. 1.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$2,613 21	-----
Paid Controller's warrants, 29th fiscal year	-----	\$2,170 18
Balance on hand June 30th, 1879	-----	443 03
Totals	\$2,613 21	\$2,613 21

SWAMP LAND DISTRICT No. 2.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$1,097 27	-----
Paid Controller's warrants, 29th fiscal year	-----	\$213 97
Balance on hand June 30th, 1879	-----	883 30
Totals	\$1,097 27	\$1,097 27

SWAMP LAND DISTRICT No. 5.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$559 98	-----
Paid Controller's warrants, 29th fiscal year	-----	\$386 66
Balance on hand June 30th, 1879	-----	173 32
Totals	\$559 98	\$559 98

SWAMP LAND DISTRICT No. 17.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$8 00	-----
Balance on hand June 30th, 1879 -----		\$8 00
Totals -----	\$8 00	\$8 00

SWAMP LAND DISTRICT No. 18.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$534 72	-----
From County Treasurers, 29th fiscal year, in warrants -----	4,575 22	-----
From County Treasurers, 30th fiscal year, in warrants -----	26,888 88	-----
Amount overpaid in warrants by Treasurer of Yolo County, 29th fiscal year -----	24 78	-----
Amount overpaid in warrants by Treasurer of Yolo County, 30th fiscal year -----	11 15	-----
Amount overpaid in warrants by Treasurer of Solano County, 30th fiscal year -----	45 54	-----
Paid Controller's warrants, 29th fiscal year -----		\$4,600 00
Paid Controller's warrants, 30th fiscal year -----		26,945 57
Balance on hand June 30th, 1879 -----		534 72
Totals -----	\$32,080 29	\$32,080 29

SWAMP LAND DISTRICT No. 41.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$0 44	-----
Balance on hand June 30th, 1879 -----		\$0 44
Totals -----	\$0 44	\$0 44

SWAMP LAND DISTRICT No. 45.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$9 85	-----
Balance on hand June 30th, 1879 -----		\$9 85
Totals -----	\$9 85	\$9 85

SWAMP LAND DISTRICT No. 46.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$5 24	-----
Balance on hand June 30th, 1879 -----		\$5 24
Totals -----	\$5 24	\$5 24

SWAMP LAND DISTRICT No. 49.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$18 70	
Balance on hand June 30th, 1879		\$18 70
Totals	\$18 70	\$18 70

SWAMP LAND DISTRICT NO. 51.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$34 08	
Balance on hand June 30th, 1879		\$34 08
Totals	\$34 08	\$34 08

SWAMP LAND DISTRICT NO. 59.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$390 38	
Balance on hand June 30th, 1879		\$390 38
Totals	\$390 38	\$390 38

ESTATES OF DECEASED PERSONS FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$15,254 84	
From County Treasurers, 29th fiscal year	2,162 56	
From County Treasurers, 30th fiscal year	94 19	
From estate of Joseph L. Folsom, deceased, 29th fiscal year	964 26	
From P. Dunlap, 30th fiscal year	825 00	
Paid Controller's warrants, 29th fiscal year		\$185 02
Paid Controller's warrants, 30th fiscal year		2,664 07
Balance on hand June 30th, 1879		16,451 76
Totals	\$19,300 85	\$19,300 85

FOLSOM BRANCH STATE PRISON FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand	\$85,494 73	
Transfer from General Fund, 29th fiscal year	85,194 73	
Transfer from General Fund, 30th fiscal year	50,000 00	
Paid Controller's warrants, 29th fiscal year		\$1,300 00
Paid Controller's warrants, 30th fiscal year		47,782 99
Transfer to General Fund, 29th fiscal year		85,194 73
Transfer to General Fund, 30th fiscal year		50,000 00
Balance on hand June 30th, 1879		36,411 74
Totals	\$220,689 46	\$220,689 46

INTEREST AND SINKING FUND OF RECLAMATION DISTRICT No. 5.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$15 65	-----
From Treasurer Sutter County, 29th fiscal year (in coupons) -----	6,300 00	-----
From Treasurer Sutter County, 30th fiscal year (in coupons) -----	16,787 44	-----
Paid Controller's warrants to pay coupons, 29th fiscal year -----	-----	\$6,300 00
Paid Controller's warrants to pay coupons, 30th fiscal year -----	-----	16,780 00
By balance on hand June 30th, 1879 -----	-----	23 09
Totals -----	\$23,103 09	\$23,103 09

SAN FRANCISCO HARBOR IMPROVEMENT FUND.

	Receipts.	Payments.
July 1st, 1877—Balance on hand -----	\$317,226 81	-----
From Harbor Commissioners, 29th fiscal year -----	284,345 06	-----
From Harbor Commissioners, 30th fiscal year -----	281,531 43	-----
Paid Controller's warrants, 29th fiscal year -----	-----	\$170,712 80
Paid Controller's warrants, 30th fiscal year -----	-----	241,264 39
Balance on hand June 30th, 1879 -----	-----	471,126 11
Totals -----	\$833,103 30	\$883,103 30

UNIVERSITY ENDOWMENT FUND.

	Receipts.	Payments.
July 1st, 1879—Balance on hand -----	\$627 20	-----
Paid Controller's warrants, 29th fiscal year -----	-----	\$627 20
Totals -----	\$627 20	\$627 20

CONDEMNATION FUND.

	Receipts.	Payments.
From L. C. Wittenmeyer, 29th fiscal year -----	\$8,000 00	-----
From J. M. Ward, Jr., 30th fiscal year -----	1,023 00	-----
Balance on hand June 30th, 1879 -----	-----	\$9,023 00
Totals -----	\$9,023 00	\$9,023 00

RECAPITULATION OF FUNDS.

Balance in each fund June 30th. 1879.

FUNDS.	Amounts.
General Fund.....	\$460,323 47
School Fund.....	190,280 24
Interest and Sinking Fund.....	253,758 97
State School Land Fund.....	37,884 03
Library Fund.....	7,766 31
Supreme Court Library Fund.....	2,627 59
War Bond Fund.....	8,595 76
Election Reward Fund.....	1,677 42
Swamp Land District No. 1 Fund.....	443 03
Swamp Land District No. 2 Fund.....	883 30
Swamp Land District No. 5 Fund.....	173 32
Swamp Land District No. 17 Fund.....	8 00
Swamp Land District No. 18 Fund.....	534 72
Swamp Land District No. 41 Fund.....	44
Swamp Land District No. 45 Fund.....	9 85
Swamp Land District No. 46 Fund.....	5 24
Swamp Land District No. 49 Fund.....	18 70
Swamp Land District No. 51 Fund.....	34 08
Swamp Land District No. 59 Fund.....	390 38
Swamp Land District No. 5 Sinking and Interest Fund.....	23 09
Estates of Deceased Persons Fund.....	16,451 76
San Francisco Harbor Improvement Fund.....	471,126 11
Folsom Branch State Prison Fund.....	36,411 74
Condemnation Fund.....	9,023 00
Total.....	\$1,498,450 53

TRANSACTIONS IN STATE BONDS.

SERIES.	Amount.	Amount.
<i>Funded debt of 1857, seven per cent. bonds.</i>		
Outstanding July 1st, 1877 -----	\$13,000 00	-----
Redeemed during the 29th fiscal year -----	8,000 00	-----
Outstanding June 30th, 1879 -----		\$5,000 00
<i>Funded debt of 1860, seven per cent. bonds.</i>		
Outstanding July 1st, 1877 -----	\$1,500 00	-----
Outstanding June 30th, 1879 -----		1,500 00
<i>Soldiers' relief seven per cent. bonds.</i>		
Outstanding July 1st, 1877 -----	\$95,500 00	-----
Outstanding June 30th, 1879 -----		95,500 00
<i>State Capitol bonds of 1870, seven per cent.</i>		
Outstanding July 1st, 1877 -----	\$250,000 00	-----
Outstanding June 30th, 1879 -----		250,000 00
<i>State Capitol bonds of 1872, seven per cent.</i>		
Outstanding July 1st, 1877 -----	\$250,000 00	-----
Outstanding June 30th, 1879 -----		250,000 00
<i>Funded debt of 1873, six per cent. bonds.</i>		
Outstanding July 1st, 1877 -----	\$2,801,000 00	-----
Outstanding June 30th, 1879 -----		2,801,000 00
Total bonds outstanding -----		\$3,403,000 00

REMARKS.—The bonds of 1857 and 1860 were all called in March 1st, 1875, and they have been no longer interest-bearing since July 31st, 1875.

BONDS HELD IN TRUST FOR STATE SCHOOL FUND.

CLASS OF BONDS.	Amount.	Total.
State Capitol bonds of 1870—7 per cent.	\$236,000 00	-----
State Capitol bonds of 1872—7 per cent.	115,000 00	-----
State Funded Debt bonds of 1873—6 per cent.	1,386,500 00	-----
		\$1,737,500 00
Santa Clara County bonds—7 per cent.	\$5,000 00	-----
Santa Barbara County bonds—10 per cent.	20,000 00	-----
San Joaquin County bonds—10 per cent.	5,000 00	-----
San Luis Obispo County bonds—8 per cent.	50,000 00	-----
San Luis Obispo County bonds—10 per cent.	10,000 00	-----
Humboldt County bonds—9 per cent.	25,000 00	-----
Tulare County bonds—10 per cent.	20,000 00	-----
Tehama County bonds—8 per cent.	11,500 00	-----
Mendocino County bonds—8 per cent.	10,000 00	-----
Lake County bonds—8 per cent.	11,400 00	-----
Sacramento County bonds—6 per cent.	26,400 00	-----
Napa County bonds—7 per cent.	60,000 00	-----
Solano County bonds—7 per cent.	10,000 00	-----
Stanislaus County bonds—8 per cent.	10,000 00	-----
		274,300 00
		\$2,011,800 00

BONDS HELD IN TRUST FOR STATE UNIVERSITY FUND.

CLASS OF BONDS.	Amount.	Total.
State Capitol bonds of 1872—7 per cent.	\$135,000 00	-----
Funded Debt bonds of 1873—6 per cent.	817,500 00	-----
		\$952,500 00
Santa Clara County bonds—7 per cent.	\$21,000 00	-----
San Francisco City and County bonds.	247,500 00	-----
City of Oakland, Alameda County—8 per cent.	13,000 00	-----
Town of Alameda, Alameda County—6 per cent.	10,000 00	-----
		291,500 00
		\$1,244,000 00

STATE DEBT AND KIND OF MONEY IN THE TREASURY, JUNE 30TH, 1879.

KIND OF DEBT.	Amount.	Total.
Outstanding 7 per cent. civil bonds of 1857, issued under the Act of April 28th, 1857.....	\$5,000 00	-----
Outstanding 7 per cent. civil bonds of 1860, issued under the Act of April 30th, 1860.....	1,500 00	-----
Outstanding 7 per cent. Soldiers' Relief bonds of 1863, issued under the Act of April 27th, 1863.....	95,500 00	-----
Outstanding 7 per cent. Capitol bonds of 1870, issued under the Act of April 4th, 1870.....	250,000 00	-----
Outstanding 7 per cent. Capitol bonds of 1872, issued under the Act of March 28th, 1872.....	250,000 00	-----
Outstanding 6 per cent. Funded Debt bonds of 1873, issued under the Act of April 2d, 1870.....	2,801,000 00	-----
Total funded indebtedness*.....		\$3,403,000 00
Outstanding Controller's warrants on General Fund.....	\$75,653 73	-----
Outstanding Controller's warrants on State School Fund.....	331 12	-----
Outstanding Controller's warrants on State Library Fund.....	585 00	-----
Outstanding Controller's warrants on San Francisco Harbor Improvement Fund.....	500 00	-----
Outstanding Controller's warrants on Folsom Branch State Prison Fund.....	6,100 40	-----
Total floating indebtedness†.....		\$3,170 25
Cash on hand (see page 13):		
Gold coin.....	\$1,235,479 50	-----
Silver coin‡.....	253,532 26	-----
United States legal tender notes.....	9,438 79	-----
Totals.....	\$1,498,450 55	\$3,486,170 25

*There is at the present time in the Interest and Sinking Fund (besides the amount required to redeem the outstanding bonds of 1857 and 1860) the sum of \$89,886 47, applicable to the redemption of bonds; but it is my opinion that an Act is necessary by the Legislature designating the particular series of bonds to be redeemed.

†All the State Controller's warrants outstanding at this date are payable upon presentation of the same, the money being in the respective funds (see page 13) upon which they were drawn.

It will be observed that, of the total bonded indebtedness of the State, the "State School Fund" holds (see page 15) \$1,737,500, and the "Consolidated Perpetual Endowment Fund of the University of California," \$952,500, making, in the aggregate, the sum of \$2,690,000, which, deducted from the total indebtedness, viz., \$3,403,000, leaves in the hands of parties unknown \$713,000.

‡The greatest portion of the silver on hand belongs to the San Francisco Harbor Improvement Fund.

INTEREST AND COUPON ACCOUNT.

BONDS.	Balance on hand July 1, 1877.	Receipts.	Payments.	Balance on hand June 30, 1879.
<i>Pacific Railroad Bonds.</i>				
Coupon No. 21 -----	\$70 00	-----	\$70 00	-----
Coupon No. 22 -----	140 00	-----	140 00	-----
Coupon No. 23 -----	140 00	-----	70 00	\$70 00
Coupon No. 24 -----	105 00	-----	105 00	-----
Coupon No. 25 -----	1,503 00	-----	1,470 00	35 00
Coupon No. 26 -----	52,500 00	-----	52,500 00	-----
Coupon No. 27 -----	-----	\$52,500 00	52,115 00	385 00
Coupon No. 28 -----	-----	52,500 00	52,150 00	350 00
Coupon No. 29 -----	-----	52,500 00	51,940 00	560 00
Coupon No. 30 -----	-----	52,500 00	-----	52,500 00
<i>State Capitol Bonds of 1870.</i>				
Coupon No. 14 -----	8,750 00	-----	8,750 00	-----
Coupon No. 15 -----	-----	8,750 00	8,750 00	-----
Coupon No. 16 -----	-----	8,750 00	8,750 00	-----
Coupon No. 17 -----	-----	8,750 00	8,750 00	-----
Coupon No. 18 -----	-----	8,750 00	-----	8,750 00
<i>State Capitol Bonds of 1872.</i>				
Coupon No. 10 -----	8,750 00	-----	8,750 00	-----
Coupon No. 11 -----	-----	8,750 00	8,750 00	-----
Coupon No. 12 -----	-----	8,750 00	8,750 00	-----
Coupon No. 13 -----	-----	8,750 00	8,750 00	-----
Coupon No. 14 -----	-----	8,750 00	-----	8,750 00
<i>Soldiers' Relief Bonds.</i>				
Coupon No. 25 -----	17 50	-----	17 50	-----
Coupon No. 26 -----	17 50	-----	17 50	-----
Coupon No. 27 -----	3,342 50	-----	3,342 50	-----
Coupon No. 28 -----	-----	3,342 50	3,325 00	17 50
Coupon No. 29 -----	-----	3,342 50	3,342 50	-----
Coupon No. 30 -----	-----	3,342 50	3,342 50	-----
Coupon No. 31 -----	-----	3,342 50	-----	3,342 50
<i>Funded Debt of 1873.</i>				
Coupon No. 8 -----	180 00	-----	150 00	30 00
Coupon No. 9 -----	84,030 00	-----	84,000 00	30 00
Coupon No. 10 -----	-----	84,030 00	84,000 00	30 00
Coupon No. 11 -----	-----	84,030 00	83,970 00	60 00
Coupon No. 12 -----	-----	84,030 00	82,920 00	1,110 00
Coupon No. 13 -----	-----	84,030 00	-----	84,030 00
<i>Swamp Land Dist. No. 5 Bonds.</i>				
Coupons Nos. 9, 10, 11, 12, 13 ---	15 65	23,087 44	23,080 00	23 09
Totals -----	\$159,563 15	\$652,577 44	\$652,067 50	\$160,073 09

I. JOSÉ G. ESTUDILLO, Treasurer of the State of California, do hereby certify that the appropriation for postage and expressage, for the Treasurer's office, for the 29th fiscal year, \$150, and also part of the appropriation of an equal sum for the 30th fiscal year, for like purpose, were expended as follows:

TWENTY-NINTH FISCAL YEAR.

For postage, expressage, post-office box rent, etc.----- \$150 00

THIRTIETH FISCAL YEAR.

1878.

July 2d—Stamps bought in Sacramento-----	\$6 00
August 3d—Stamps bought in Sacramento-----	5 00
September 2d—Stamps bought in Sacramento-----	3 00
September 17th—Stamps bought in Sacramento-----	3 00
October 5th—Stamps bought in Sacramento-----	6 00
October 11th—Wells, Fargo & Company's Express envelopes bought in San Francisco--	5 00
November 2d—Stamps bought in Sacramento-----	6 00
December 4th—Stamps bought in Sacramento-----	6 00

1879.

January 2d—Stamps bought in Sacramento-----	3 00
January 16th—Stamps bought in Sacramento-----	3 00
February 4th—Stamps bought in Sacramento-----	6 00
March 6th—Stamps bought in Sacramento-----	5 00
March 17th—Wells, Fargo & Company's Express envelopes-----	5 00
April 3d—Stamps bought in Sacramento-----	5 00
May 2d—Stamps bought in Sacramento-----	5 00
June 2d—Stamps bought in Sacramento-----	5 00
June 30th—Stamps bought in Sacramento-----	5 00
Post-office box rent-----	6 50

\$88 50

JOSÉ G. ESTUDILLO.

Sworn and subscribed to before me this 29th day of September,
A. D. 1879.

[SEAL.]

D. B. WOOLF, Clerk.
By JOHN P. POOLE, Deputy Clerk.

REPORT

OF THE

ATTORNEY-GENERAL

FOR

THE YEARS 1878 AND 1879.



REPORT.

OFFICE OF THE ATTORNEY-GENERAL OF THE STATE OF CALIFORNIA. }
SACRAMENTO, December 1st, 1879. }

To His Excellency, William Irwin, Governor of California:

SIR: In compliance with the several statutes regulating the duties of the office of Attorney-General, I have the honor herewith to submit to your Excellency the biennial report concerning the business of the State, and so much of the proceedings of this department, together with such suggestions as seem proper in connection therewith.

The abstract from my official docket, appended to this my report, contains a more concise and intelligible statement of the various suits to which the State is or has been a party for the past two years than can be given in any other form, the same being a concise history of each action. I have, in the Supreme Court, argued each of the cases appearing on my official docket, and have also filed written or printed briefs in each case. I have, whenever I have been able so to do from press of other business, assisted the District Attorneys in the *nisi prius* Courts in the trial of all important cases in which I might be able to render them assistance. I have also, whenever called upon, given written opinions to the various State and county officers—copies of which are on file in my office subject to the examination of your Excellency and the members of the Legislature. I have also, whenever called upon, given written opinions to all persons calling for the same whether official or not; this correspondence has been varied and voluminous.

INCREASE OF BUSINESS AND ITS CAUSES.

From the abstract from my official docket presented with this report, it will be seen that the business of this office has considerably increased over past years. I regret to say that the criminal record of our Courts shows an increase of crime rather than a diminution. I am sorry that this is the case, but I think that it may be accounted for in several ways. The growth of the State in business and population would naturally tend, in some degree, to increase the criminal calendar. It has also been effected to a considerable extent by the fact that for the past several years a very large class of our accessions from immigration have been persons of little or no means. These persons have rushed into our State from all parts of the world, dependent solely upon their labor for support and for maintenance of their families. The extreme pressure in the money market, the hardness of the times, the fact that our harvests and our agricultural productions have been less abundant than was expected, so as to lessen rather than increase the demand for unskilled labor, these, and other causes

of like character, have had the effect of causing many who would under more favorable circumstances have been able to do better, from enforced idleness to fall into crime.

The history of criminal jurisprudence in every country has proven that no cause is more prolific of crime than enforced idleness and poverty combined together. The extreme difficulty from the causes before mentioned of securing remunerative labor have also tended in some portions of the State to threaten at times serious trouble and opposition to lawful authority. It is a matter of pride with us that while in portions of the older and better regulated States these outbursts have been of a marked character, we have at all times maintained the superiority of the law and the dignity of the lawful authority, and peace and quiet have been preserved. And remembering at the same time that in the presence of the Chinese amongst us we have had a continued and constant cause of agitation, calculated in many ways to anger those who, feeling the serious pains and inconvenience of poverty and want of employment, have found themselves crowded from the labor market by a population and a people with whom in the nature of things we have no feelings in harmony, and who, from their education, character, and wants are able, not only to underbid our own laboring classes in the matter of wages, but who can do well on wages upon which our heads of families depending on their labor are unable to support their families, much less to clothe and school their children.

CHINESE IMMIGRATION.

While upon the subject of the Chinese amongst us, I deem it not improper to suggest to your Excellency the propriety, in your message to the next Legislature, of again calling this subject to their attention, in order that they may in turn memorialize Congress and again attempt, by proper and lawful legislation, to rid our beautiful State of this curse of the Chinese. I am satisfied that our friends in the Eastern States require to be educated on this subject, and if they can be brought to realize, as we do, the unmitigated evil and curse these people are to us in every way, crowding as they do our jails and courts with their criminals, debauching as they do our youth in every city, town, and village, and mining camp, with their brazen and debased harlots, adding nothing to the material prosperity of our State, but, like a loathsome leprosy, defiling and injuring our whole people, they would agree with us in our efforts to rid us of these people, and they would not do or think of us as they have in the past. I am hopeful that by our continued, constant, consistent, and united appeals to them that we may in time impress upon them the importance of this matter to us. I am satisfied that they will, when fully informed of the effect of the coolie system of slavery in California, see it as we do—a slavery more immoral and debased, more injurious and less defensive in every way than any slavery ever before known in the history of mankind. I cannot but think that their want of interest in this matter lies in the fact, not that they are careless of our welfare or of the cause of religion and humanity, but because they have not been heretofore educated as to our wants and the proper remedy.

TAXATION AND EQUALIZATION.

I have, in conjunction with your Excellency and the State Controller, acted for the past two years as one of the State Board of Equalization. We found that under the present (the old) Constitution that our powers as a Board were little other than advisory. Under the new Constitution the new Board of Equalization will, I hope, by proper and apt legislation, be clothed with such powers as may make this one of the most useful and efficient departments of the State government. An equal and exact distribution of taxes, and the burdens of the people in support of the government, has, in the past, been impossible. I hope that the wisdom of our next Legislature will devise laws that will enable the new Board of Equalization to enforce this long desired end, and that it may not be hereafter said that the burdens of taxation fall too heavily on the producing and poorer classes, and not equally on all.

I believe that under the new Constitution that a more equal and just system of taxation can be obtained, and that as all classes of property must be taxed, that from this cause taxes will be necessarily much reduced, and the burdens on our laboring and producing classes be made lighter and more easily borne.

No man who realizes the blessings of liberty and a good government should shirk from contributing his just proportion toward its maintenance. As a general rule, no one pays any debt more grudgingly than his debt of taxation, but when, as now, we look forward to the fact that each, according to his means, is expected and required to contribute, this fact will tend to make the burden borne by all be borne more cheerfully as a public duty.

Under the revenue laws, as they now stand, when the State has become the purchaser of lands for unpaid taxes under the provisions of Section 3773 of the Political Code, as amended March 24th, 1874 (vide Amendments 1873-4, page 148), and where no redemption has been had of such lands as provided under the provisions of Section 3780 of Political Code, as amended January 15th, 1876 (vide Amendments 1875-6, page 62), it is made necessary, under the amendment to Section 3897 of Political Code (vide Amendments 1873-4, page 153), before the State can resell or dispose of her interest or estate in the property, to institute, by the Attorney-General or District Attorney, a suit by the State to obtain possession of the lands so bought by the State, before any sale or disposition can be made of the same by the State, and that no sale can be made for less than double the amount of unpaid taxes levied on such property, and of all interest, costs, and expenses, etc. This seems to me, and experience has proven, that it is a useless expense. I suggest that the Legislature can enact a law which will avoid the necessity of this useless trouble and expense, and that the new Board of Equalization, under such restrictions as may to the Legislature seem proper, may be empowered to resell all lands so acquired by the State for unpaid taxes due the State, when she is a purchaser and no redemption is made, and where there is no actual adverse possession to the State, upon the payment to the proper officers of all unpaid taxes, or double that sum, and all percentage, costs, expenses, etc., giving to the former owner or claimant such preference as would be just, and thereby saving to the purchaser useless expense, trouble, and delay in acquiring the title. This power could be vested in the Board, or the Presi-

dent thereof, or it could be vested in a Commissioner; or the Superior Court of the county in which the lands are situated might, with proper safeguards, be empowered to appoint such Commissioner.

I respectfully refer your Excellency and the Legislature to the several sections of the Political Code, and the various amendments thereto, beginning at Section 3764 and ending at Section 3898, which the experience of the present Board has, in the respects pointed out, found to be cumbersome and inconvenient, and which, in my opinion, may be simplified, either by the course suggested or by some other mode equally efficient and simple, and which will have the desired end.

LEGISLATION UNDER THE NEW CONSTITUTION.

Whatever may have been the difference of opinion prior to the adoption of the new Constitution as to the propriety of its adoption, the will of the people having been announced at the ballot-box, and the sovereign people of the State having, in the manner provided by law, pronounced in favor of the new Constitution, no honest man will now hesitate to say that the next Legislature, having imposed upon it the duty of framing legislation in accordance with, and such as will enable the due execution and enforcement of the instrument, are required and expected, in good faith, to do everything in their power to give effect to the fullest extent to each and every of its provisions, whether they were in favor of its adoption by the people or not.

While it was a debatable question before its adoption, and was open to the fair criticism of every voter who saw proper to oppose it, having by its adoption become the supreme law of the State, no effort to render it operative in every particular should by the Legislature be left undone. I should consider it not only unwise and inexpedient, but of the utmost bad faith on the part of the law-maker who, having taken an oath to support the Constitution of his State, should not only forget his duty as a citizen, and his oath as a legislator, but should fail or refuse to discharge his duty as such, or fail to do his utmost to carry out the provisions of the instrument in its letter and in its spirit by the passage of such laws as will secure its efficient operation in every particular.

The new Constitution, not being self-assertive or active in many of its provisions, will require friendly and affirmative legislation upon most of them. Particular attention should be given to the preparation of the various Acts upon the portions which conflict with or change the provisions of the former organic law. Experience has taught us that much trouble is saved the citizen by harmony between the Acts of the law-maker and the provisions of the organic law. I doubt not that the wisdom and patriotism of our next Senate and Assembly will justify their election by their respective constituencies as the first law-makers under the new Constitution. I take great pleasure in believing that they will have the honest, intelligent, and patriotic cooperation of the incoming Executive, and of the several members of his administration, in their efforts to secure to the people of the State all the good results possible to be obtained from the adoption of the new Constitution.

ESCHEATED ESTATES.

Under the provisions of an Act entitled "An Act to add a new section to the Political Code, to be numbered Section 474, relative to the duties of the Attorney-General," approved April 1st, 1876, I have, as required by said Act, proceeded as far as possible to its enforcement to the discovery and recovery to the State of the estates of deceased persons liable to escheat, and to declare and secure the escheat of the same to the State.

I respectfully refer to the report of the State Controller, which contains an itemized account of the sums realized so far from said estates. I have also in my hands, and will pay over the same in a few days and as soon as a question of compensation for attorney's fees and costs and expenses are adjusted, the further sum of \$2,759 13. The sums now in my hands, instead of having been paid to the County Treasurers and by them paid into the State treasury, have been collected by suits, and will be by me paid to the State Treasurer direct. Besides these sums, considerable other money has been paid into the treasury by County Treasurers which do not appear in the Controller's report, the same having been paid in since the publication of the last reports.

The several sums paid into the State treasury by the various County Treasurers and by myself are the proceeds of the personal estates of deceased persons only. Besides these sums, the proceeds of personal property of escheated estates, the State of California, by proceedings instituted under the law quoted above, has become the owner of real estate from the estates of deceased persons, the same being liable to escheat, which by decree of Court has vested in the State. In most of these cases the lands are of but small value, in many cases town lots of inconsiderable value, but in several instances the appraised value of real estate so declared escheat is considerable, in some cases several thousand dollars.

Under the provisions of Title VIII, Part III, Code of Civil Procedure, no adequate or proper provision is made for the disposition or sale by the State of real estate vested in the State by proceedings to declare the escheat. The title referred to (vide Section 1270, Code of Civil Procedure) makes provisions for a receiver of rents and profits, but no adequate provision is made for the sale of the lands themselves.

I suggest that the law be so amended as to empower the Superior Courts, of the several counties of this State, to make or cause to be made a due appraisement of such lands, and upon application of the Attorney-General, or the District Attorney of the county under the direction of the Attorney-General, to cause the same to be sold by a Commissioner appointed by the Court, and the proceeds paid into the State treasury as other money, the proceeds of escheated estates. The sale, in no case, to be for less than the appraised value, and, in all cases, to be after due publication, to the highest bidder for cash.

My principal reason for this is that the State is not the proper party to be the owner of this kind of property. The State is a loser by the transaction, the rents and profits are eaten up by the costs of running, keeping, and repairing, etc., etc., and little or nothing is realized to the State. The property being public property pays no taxes. It being public property it is not improved nor made valuable by any outlay upon it. It is not like other State lands liable to be sold under

the general land system of the State, and can properly be sold in no other manner profitably to the State or safely to the interests of the heirs or claimants of the decedent should they hereafter present themselves.

I suggest that an Act could be so framed as to preserve the rights of all, and the money being paid into the State treasury; the State, as its custodian, is safe, because she holds the funds. The lands, as they now are, are unproductive to the State, and by the plan proposed not only does the State get the appraised value of the property, but the lands themselves, passing into the hands of private parties, become part of the taxable property of the State; and when they become the subject of private ownership they are likely then to be improved and become the homes of citizens who will utilize them as such.

WATER FOR ASYLUM AND UNIVERSITY.

Under the provisions of an Act entitled "An Act to provide a supply of water for the University and for the Asylum for the Deaf, Dumb, and Blind," approved April 1st, 1876, and an Act entitled "An Act to provide a supply of water for the Napa Insane Asylum," approved March 5th, 1876, I have, as required, commenced actions for securing for the use of the Insane Asylum, at Napa, a supply of fresh water. The supply obtained is not as abundant as would be desired, but, by careful management, it is hoped and believed will be sufficient.

An action is now pending in the District Court of Alameda County for the purpose of condemning and securing for the use of the State University, and to the Deaf, Dumb and Blind Asylum, near Berkeley, a like supply. I am advised that the persons claiming the interest sought to be condemned are claiming large sums for their interests. As the sums to be paid must not only be passed upon by the Court but also be approved by the Governor before paid, the interest of the State will be fully guarded and maintained.

STATE PRISON LITIGATION.

In compliance with the orders of the Board of State Prison Directors, I commenced an action in the Sixth District Court of Sacramento County to recover from the principal and his sureties, on the bond of M. Miles, for failure to perform the contract entered into by him for the construction of the Branch State Prison at Folsom. Miles, who had taken the contract, was required to, and did, enter into bonds for the faithful performance of the work. After performing a part only of the work, it is claimed that he, without just cause, abandoned the contract and quit work, leaving the contract incomplete, hence the suit. After much delay the suit finally resulted in the defeat of the plaintiff in the lower Court, the Court not only deciding against the State but strangely and, I think, erroneously rendering a large judgment over against the State in favor of the defendant and his assignees. I prepared an appeal, which is now pending in the Supreme Court. I am of opinion that the judgment will and ought to be reversed. I am clear that whatever may be the grounds of defense to the action that there is no authority to justify a judgment over against the State, by way of set off or counter claim, in this

character of action, being a suit of the State, the sovereign, against one or more of her citizens.

STATE UNIVERSITY.

By an Act approved April 1st, 1878, entitled "An Act to create a Commission to report the condition of certain funds," it was made the duty of the State Controller, State Treasurer, the Surveyor-General, and the Attorney-General to report to the next Legislature the condition of certain funds in the said Act enumerated, as also of the sales of the lands belonging to the University. In compliance with the duty imposed on us by the said Act we have performed the labor required from the best sources of intelligence at our command.

The various matters upon which we were required to report being mainly shown by the records of the State Controller, State Treasurer, and Surveyor-General, on file in their offices, I take great pleasure in acknowledging the obligations that each member of the Commission are under to the State Controller for his industry and patience in compiling and tabulating the various matters embraced in the report. The matters embraced in the report commend themselves to the careful consideration of the next Legislature.

STATE LAND AT ROCKLIN.

The State of California is the owner of the southeast quarter of section (19) nineteen, township (11) eleven north, range (7) seven east, Mount Diablo base and meridian, Placer County.

The origin of this title will be found in Section 4 of an Act entitled "An Act to aid in the construction of the Central Pacific Railroad, and to secure the use of the same to this State for military and other purposes, and other matters relating thereto," approved April 4th, 1864. (Vide Statutes 1863-4, pages 344, 5, and 6 inclusive.) The deed from the Central Pacific Railroad Company, dated May 14th, 1875, from some cause does not convey the south half of the section, as in the Act provided, but only the southeast quarter of the section. As the Act calls for the whole half of the section, I am not advised why it has not all been conveyed, but suppose that the mineral not yet having been proven off of the remainder of the half section the railroad company has not yet been able to complete its title thereto. The land now owned by the State and the remaining portion of the half section referred to contains valuable and almost exhaustless granite quarries, which are near to the railroad and are valuable. When the Act of 1863-4 was passed the State was then engaged in the erection of the State Capitol, and the plan then under way was to build of granite. This plan was after that time changed and the building, which had been commenced with cut granite, was afterwards finished with brick. The land was taken by the State for the purpose that she might own her own granite quarries and use the stone for the completion of the State Capitol. Since the granite work on the State Capitol ceased the State has made no use of her property, and it has been disused by the State for any purpose.

Within the past two years, lying as it does so near the railroad and containing such supplies of granite, many persons, considering it a kind of public property, have from time to time entered upon the lands

and taken the granite therefrom and used and sold it in the market. My attention being called to this abuse and waste of the State's property, I attempted to induce the trespassers to desist, and, upon their refusal, I have brought actions to restrain them. An order of restraint was issued from the District Court of Placer County. The suits are yet undetermined but will be maintained by the State, as her title to so much as herein first stated is unquestioned.

As to those lands I renew the advice I have hereinbefore given as to other lands held by the State from escheats and those purchased in former tax sales. I deem it impolitic for the State to own as a private proprietor any lands or property not devoted to public uses, such as her Capitol, her University, her Asylums, Prisons, etc. I can see no use she could or would likely put this land to in the future. In the location of her Branch State Prison the Commissioners selected another site, upon which granite in inexhaustible quantities is found. The State Capitol is completed, and she can find no use for her granite, or if she did she could purchase in the market cheaper than she could take the same from her own quarries. So long as the lands are, as they now are, exposed and undisposed of they will be a source of constant expense, vexation, and annoyance to protect them, or if not protected they will be used and injured by trespassers. I suggest, therefore, that they should be sold or disposed of, as the Legislature may deem proper, so that, becoming as they will the subject of private ownership, they become part of the taxpaying and producing property of the State.

BANK COMMISSIONERS.

The Act approved March 30th, 1878, entitled "An Act creating a Board of Bank Commissioners, and prescribing their duties and powers," made it the duty of the Attorney-General to receive the reports of the Bank Commissioners, and to act as their attorney and advisor in and about the discharge of their duties, and in enforcing the law against such banks and banking institutions as refused to comply with the several provisions of the Act referred to. Shortly after the formation of the Commission the several commercial banks in the City of San Francisco, acting under the advice of their respective counsel, resisted and refused to permit the exercise of the visitatorial and inquisitorial powers conferred by the Act as to them, they claiming that the powers conferred were not intended to reach any other than savings and loan associations. The question, having been carried by appeal from the lower Court to the Supreme Court, was decided in favor of the exercise of all the powers conferred by the Act, as well to commercial banks as to saving and loan associations; since which time no trouble has arisen, but the commercial banks have cheerfully submitted to the decision. The labors of the Bank Commissioners have not been hindered or delayed by any bank or banking institution, and all concur in commending the propriety of the law and the advantage of its due administration.

The Commission has been an eminent success; the public have been much benefited by their labors, and all solvent and well regulated banks have been beneficially effected by the increased security in the public mind. I think a continuation of this Commission desirable, and doubt not that the wisdom of the Legislature will continue the Commission as one of the necessary Commissions under the new Constitution.

RAILROAD COMMISSIONER.

The statute creating this office has also made it my duty to act as the attorney of this Commission. Since the Act of the last session, reducing the Commission to one member, I have had occasion frequently to advise and confer with the Commissioner, whose diligence and zeal in the discharge of his duties has warranted the fitness of his selection to fill that important office. Under the former statutes his powers have been necessarily so limited as to embarrass him much in the discharge of his duties. Notwithstanding this, however, he has earned the gratitude of the people for his constant and unremitting discharge of his duties, so far as it was possible for him to act.

Under the new Constitution the powers bestowed upon the new Board of Commissioners will be found so full that they will not, I hope, find themselves so hampered and burdened as were the former Board. I am confident that the public will receive from their efforts the protection they so much need and expect.

EXPENDITURES.

I have expended of the various appropriations for the support of this office, as follows:

FOR TWENTY-NINTH FISCAL YEAR.

Traveling expenses.....	\$755 00
Costs and expenses of suits in which the State was a party in interest.....	2,783 75
Postage and contingent expenses.....	100 00
Pay of Porter.....	100 00
Total.....	\$3,738 75

FOR THIRTIETH FISCAL YEAR.

Costs and expenses of suits in which the State was a party in interest.....	\$977 50
Pay of Porter.....	100 00
Postage and contingent expenses.....	82 00
Total.....	\$1,159 50

FOR THIRTY-FIRST FISCAL YEAR.

Costs and expenses of suits in which the State was a party in interest.....	\$401 80
Pay of Porter.....	41 65
Total.....	\$443 45

There are yet to come in for costs and expenses of suits, in which the State is a party in interest, several small sums for attorney's fees and Court fees and costs, in different cases which are not yet presented, but the amount will be small.

It will be seen that this office has been conducted within the appropriation, and that of the amount appropriated for the expense of suits will not be half consumed; during the two former years such was also the case. The State in the meantime, outside of these appropriations, has not incurred any liability for attorney's services outside of this office.

I recommend that the appropriations for the support of this office be not lessened from this fact, as a contingency may rise at any time, when it may be essential that the Attorney-General be not only

ready to command the aid of able counsel in the business of the State, but ready to make arrangements out of this fund.

I have no other or further suggestions to make to your Excellency. Any other information desired, as to the condition of the litigation in which the State is a party, can be obtained from my official docket accompanying this report.

I have the honor to be most respectfully,

Your most obedient servant,

JO HAMILTON,
Attorney-General.

COPY OF ATTORNEY-GENERAL'S DOCKET FOR THE YEARS 1878-79.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution, and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,305—The People, etc., Appellant, vs. J. M. Sprague and J. F. Buslin, Respondents.	County Court, San Joaquin County.	Criminal.	Indictment—Extortion.	Indictment filed May 31, 1877. Demurrer filed August 8, 1877. Demurrer sustained Sept. 3, 1877. Notice of appeal filed Sept. 8, 1877.	Oct. 11, 1877—Transcript filed. Nov. 15, 1877—Argument and submitted. Nov. 27, 1877—Judgment affirmed.	Dec. 22, 1877—Remittitur issued.
10,307—The People, etc., Respondent, vs. Sylvester Moroles, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment—Assault with intent to commit murder.	Sept. 14, 1877—Indictment filed. Sept. 20, 1877—Demurrer filed. Sept. 29, 1877—Demurrer overruled. Sept. 29, 1877—Plead not guilty. Sept. 29, 1877—Tried and convicted as charged. Oct. 6, 1877—Sentenced to two years in State Prison. Oct. 8, 1877—Notice of appeal filed.	Oct. 15, 1877—Transcript filed. Jan. 15, 1878—Submitted on briefs on file. Jan. 21, 1878—Judgment affirmed.	Feb. 15, 1878—Remittitur issued.
10,308—The People, etc., Respondent, vs. Sylvester Moroles, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment—Robbery.	Sept. 14, 1877—Indictment filed. Sept. 20, 1877—Demurrer filed. Sept. 29, 1877—Demurrer overruled. Sept. 29, 1877—Plead not guilty. Sept. 29, 1877—Tried and convicted. Oct. 6, 1877—Sentenced to six years in State Prison. Oct. 8, 1877—Notice of appeal filed.	Oct. 15, 1877—Transcript filed. Jan. 15, 1878—Submitted on briefs on file. Jan. 21, 1878—Judgment affirmed.	Feb. 15, 1878—Remittitur issued.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution, and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,309—The People, etc., Respondent, vs. Benedito Volenzuela, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment—Assault with intent to commit murder.	May 9, 1877—Indictment filed. Sept. 26, 1877—Defendant plead not guilty. Sept. 26, 1877—Tried and convicted. Oct. 2, 1877—Sentenced to imprisonment for the term of five years. Oct. 2, 1877—Notice of appeal filed.	Oct. 18, 1877—Transcript filed. Jan. 15, 1878—Judgment reversed.	Feb. 10, 1878—Remittitur issued.
10,310—The People, etc., Respondent, vs. John Gray, Appellant.	County Court, County of Sacramento.	Criminal.	Indictment—Rape.	Aug. 12, 1876—Indictment found. August 14, 1877—Defendant plead not guilty. March 15, 1877—Convicted of an attempt to commit rape. March 21, 1877—Sentenced to two years in State Prison. March 21, 1877—Notice of appeal filed.	Oct. 26, 1877—Transcript filed Jan. 15, 1878. Submitted on briefs on file. —, 1878—Judgment affirmed.	Feb. 10, 1878—Remittitur issued.
10,311—The People, etc., Respondent, vs. Wong Chu Shui, Appellant.	Seventeenth District Court, County of Los Angeles.	Criminal.	Indictment—Murder.	Sept. 14, 1877—Indictment found. Sept. 19, 1877—Plead not guilty. Sept. 27, 1877—Tried and convicted of murder in first degree. Oct. 10, 1877—Sentenced to State Prison for life.	Oct. 26, 1877—Transcript filed. —, 1878—Judgment reversed.	
10,312—The People, etc., Appellant, vs. James McKeller, Respondent.	County Court, San Joaquin County.	Criminal.	Indictment—Burglary.	May 31, 1877—Indictment found; defendant plead not guilty. —, 1877—Verdict of guilty of burglary in first degree. Oct. 13, 1877—Defendant granted a new trial. Oct. 13, 1877—Notice of appeal filed.	Oct. 30, 1877—Transcript filed. Nov. 15, 1877—Appellant's motion for a new trial denied. Nov. 30, 1877—Order affirmed.	Nov. 30—Remittitur issued.

10,313—The People, etc., Respondent, vs. John McCormack, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment—Grand larceny.	Nov. 15, 1876—Indictment found. Nov. 16, 1876—Defendant plead not guilty. Nov. 21, 1876—Tried and convicted. Nov. 23, 1876—Sentenced to ten years in State Prison. Sept. 28, 1877—Notice of appeal filed.	Nov. 2, 1877—Transcript filed. Nov. 27, 1877—Submitted on briefs. Dec. 6, 1877—Judgment affirmed.	Dec. 31, 1877—Remittitur issued.
10,314—Ex parte E. N. Colhill, on habeas corpus.	Supreme Court.				Nov. 12, 1877—Argued and submitted. Nov. 23, 1877—Prisoner remanded.	
The People, etc., ex rel. Jo Hamilton, Attorney-General, Plaintiff, vs. The Sacramento and Yolo Bridge Company, Defendant.	Sixth District Court, County of Sacramento.	Civil action.	Complaint—An action against defendant for usurping and exercising corporate powers.	Oct. 19, 1877—Petition filed and leave to bring suit in the name of The People granted.		
The People, etc., ex rel. F. A. Tracy, Plaintiff, vs. John Bile, Defendant.	Sixteenth District Court, County of Kern.	Civil action.	Complaint—An action under the provisions of Chapter V, Part II, Title IX, Code of Civil Procedure, to determine the right of defendant to hold the office of Supervisor.	Nov. 26, 1877—Petition filed and leave granted to bring suit.		

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
The People, etc., ex rel. Peter Donohue, Plaintiff, vs. Daniel McKinley, James McKinly, and the Berry Street Railroad Company, Defendants.	Nineteenth District Court, City and County of San Francisco.	Civil action.	Complaint—An action to test the constitutionality of two ordinances of the Board of Supervisors of the City and County of San Francisco, authorizing defendants to lay railroad tracks on certain streets in said city.	Dec. 28, 1877—Petition filed and leave granted to bring suit.		
10,315—Ex parte, — Frank, on habeas corpus.	Supreme Court.				November 17, 1877—Petition filed. March 1, 1878—Ordered that prisoner be discharged.	
10,316—The People, etc., Respondent, vs. John Brown, Appellant.	County Court, County of Solano.	Criminal.	Indictment—Burglary and prior conviction of a felony in the County Court of Napa.	Dec. 21, 1875—Indictment found. Aug. 10, 1876—Defendant plead not guilty of burglary, but plead guilty to the former conviction. April 9, 1877—Tried and convicted. April 20, 1877—Sentenced to ten years in State Prison. Nov. 7, 1877—Notice of appeal filed.	Nov. 16, 1877—Transcript filed. Jan. 15, 1878—Judgment affirmed.	Feb. 10, 1878—Remittitur issued.
10,317—The People, etc., Appellant, vs. Ah Tye, Respondent.	County Court, County of Calaveras.	Criminal.	Indictment—Attempt to steal gold dust from a mining claim.	Dec. 5, 1877—Indictment filed. Dec. 6, 1877—Demurrer filed and sustained. Dec. 11, 1877—Notice of appeal filed.	Dec. 15, 1877—Transcript filed. Jan. 16, 1878—Judgment affirmed.	Feb. 10, 1878—Remittitur issued.

10,318—Ex parte, Black, on habeas corpus.	Supreme Court.				—, 1877—Petition filed. Dec. 11, 1877—Ordered that writ issue returnable before County Court, Sacramento County.	
10,319—The People, etc., Respondent, vs. Frank C. Pease, Appellant.	County Court, County of San Joaquin.	Criminal.	Indictment—Burglary.	Dec. 15, 1876—Indictment found. Oct. 6, 1877—Defendant plead not guilty. Oct. 8, 1877—Defendant tried and convicted. Oct. 11, 1877—Sentenced to six years in State Prison. Nov. 23, 1877—Notice of appeal filed.	Dec. 19, 1877—Transcript filed. Jan. 15, 1878—Dismissed by stipulation.	
10,320—The People, etc., Respondent, vs. Hiram Henderson and Robt. Simpson, Appellants.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Robbery.	September 1, 1877—Indictment found. Sept. 8, 1877—Defendant plead not guilty. Dec. 6, 1877—Tried and convicted. Dec. 15, 1877—Defendant Henderson sentenced to two years in State Prison, and defendant Simpson to four years in State Prison. Dec. 13, 1877—Notice of appeal given.	Dec. 29, 1877—Transcript filed. March 4, 1878—Judgment affirmed.	March 30, 1878—Remittitur issued.
10,321—The People, etc., Respondent, vs. R. M. Barton, Appellant.	County Court, County of San Diego.	Criminal.	Indictment—Murder.	Aug. 3, 1877—Indictment found. —, 1877—Defendant plead not guilty. Nov. 18, 1877—Tried and convicted of murder in second degree. Dec. 5, 1877—Sentenced to ten years in State Prison. Dec. 5, 1877—Notice of appeal filed.	Jan. 15, 1878—Argued and submitted. March 2, 1878—Judgment affirmed.	March 28, 1878—Remittitur issued.
10,322—The People, etc., Respondent, vs. Griffin, Appellant.					Jan. 15, 1878—Judgment reversed.	Feb. 11, 1878—Remittitur issued.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,323—The People, etc., Respondent, vs. Henry Thompson, Appellant.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Counterfeiting.	Dec. 9, 1876—Indictment found. Jan. 11, 1877—Plead not guilty. April 10, 1877—Tried and convicted. Dec. 22, 1877—Sentenced to four years in State Prison. Dec. 29, 1877—Notice of appeal filed.	Jan. 15, 1878—Transcript filed. April 9, 1878—Judgment affirmed.	May 4, 1878—Remittitur issued.
10,324—The People, etc., Respondent, vs. J. D. Methvin, Appellant.	County Court, County of Colusa.	Criminal.	Indictment—Grand larceny.	Oct. 20, 1877—Indictment found. Nov. 2, 1877—Tried and convicted. Nov. 2, 1877—Sentenced to three years in State Prison. Nov. 27, 1877—Notice of appeal filed.	Jan. 15, 1878—Transcript filed. April 11, 1878—Judgment affirmed.	May 7, 1878—Remittitur issued.
10,325—The People, etc., Respondent, vs. Walter Carrick, Appellant.	Ninth District Court, County of Siskiyou.	Criminal.	Indictment—Murder.	May 19, 1877—Indictment found. May 28, 1877—Demurrer filed. May 30, 1877—Demurrer overruled. Oct. 27, 1877—Tried and convicted of murder in first degree. Nov. 3—Sentenced to the State Prison for life. Nov. 3, 1877—Notice of appeal filed.	Jan. 28, 1878—Transcript filed. —, 1878—Judgment affirmed.	Aug. 4, 1878—Remittitur issued.
10,326—The People, etc., Respondent, vs. Alexander Condry, Appellant.	County Court, County of Siskiyou.	Criminal.	Indictment—Robbery.	Nov. 26, 1876—Indictment found. Nov. 27, 1876—Defendant plead not guilty. Dec. 18, 1876—Tried and convicted. Dec. 30, 1876—Sentenced to ten years in State Prison. Dec. 13, 1877—Notice of appeal filed.	Jan. 28, 1878—Transcript filed. April 10, 1878—Judgment affirmed.	Remittitur forthwith.

10,327—The People, etc., Respondent, vs. Noah Thompson, Appellant.	County Court, County of Sierrayou.	Criminal.	Indictment—Grand larceny.	Nov. 22, 1876—Indictment found. Nov. 27, 1876—Defendant plead not guilty. Jan. 17, 1877—Tried and convicted. Jan. 18, 1877—Sentenced to ten years in State Prison. Dec. 13, 1877—Notice of appeal filed.	Jan. 28, 1878—Transcript filed. April 10, 1878—Judgment affirmed.	May 5, 1878—Remittitur issued.
10,328—The People, etc., Respondent, vs. Eli Kelly, Appellant.	County Court, County of Sierrayou.	Criminal.	Indictment—Robbery.	Nov. 26, 1876—Indictment found. Nov. 27, 1876—Defendant plead not guilty. Dec. 28, 1876—Tried and convicted. Dec. 30, 1876—Sentenced to eight years in State Prison. Dec. 30, 1876—Notice of appeal filed.	Jan. 28, 1878—Transcript filed. April 10, 1878—Judgment affirmed.	May 5, 1878—Remittitur issued.
10,329—The People, etc., Respondent, vs. Stephen S. Moore, Appellant.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Embezzlement.	Sept. 3, 1877—Indictment found. Sept. 8, 1877—Defendant plead not guilty. Dec. 4, 1877—Tried and convicted. Jan. 12, 1878—Sentenced to five years in State Prison. Jan. 16, 1878—Notice of appeal filed.	Jan. 28, 1878—Transcript filed. April 10, 1878—Judgment affirmed.	Remittitur issued forthwith.
10,330—The People, etc., Respondent, vs. James Jones, Appellant.	County Court, County of San Joaquin.	Criminal.	Indictment—Robbery.	Nov. 24, 1877—Indictment found. Dec. 12, 1877—Tried and convicted. Dec. 17, 1877—Sentenced to six years in State Prison. Jan. 4, 1878—Notice of appeal filed.	Jan. 29, 1878—Transcript filed. April 25, 1878—Judgment affirmed.	May 20, 1878—Remittitur issued.
10,331—The People, etc., Respondent, vs. Antonio Norme, Appellant.	Tenth District Court, County of Colusa.	Criminal.	Indictment—Murder.	July 10, 1877—Indictment found. Dec. 12, 1877—Tried and convicted of murder in first degree. Dec. 14, 1877—Sentenced to the State Prison for life. Jan. 31, 1878—Notice of appeal filed.	Feb. 2, 1878—Transcript filed. April 11, 1878—Judgment reversed.	May 6, 1878—Remittitur issued.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CASE.	In what county, district and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,334—The People, etc., Respondent, vs. M. B. Baily, Appellant.	County Court, County of Colusa.	Criminal.	Indictment—Robbery.	Oct. 20, 1877—Indictment found. Nov. 1, 1877—Defendant plead not guilty. Nov. 2, 1877—Tried and convicted. Nov. 24, 1877—Sentenced to three years in State Prison. Jan. 31, 1878—Notice of appeal filed.	Feb. 4, 1878—Transcript filed.	
10,335—The People, etc., Respondent, vs. Trinidad Nuñez and José Machado, Appellants.	County Court, County of Sierra.	Criminal.	Indictment—Robbery.	Sept. 19, 1877—Indictment found. Sept. 24, 1877—Defendant Nuñez filed demurrer. Sept. 26, 1877—Demurrer overruled. Sept. 27, 1877—Defendant Nuñez plead not guilty. Oct. 3, 1877—Defendant Machado plead not guilty. Oct. 8, 1877—Defendants tried and convicted. Oct. 9, 1877—Sentenced to eight years in State Prison. Dec. 6, 1877—Notice of appeal filed.	Feb. 7, 1878—Transcript filed. April 10, 1878—Judgment affirmed.	May 5, 1878—Remittitur issued.
10,336—The People, etc., Respondent, vs. Wm. E. Green, Appellant.	County Court, County of San Joaquin.	Criminal.	Indictment—Robbery.	Nov. 24, 1877—Indictment found. Nov. 24, 1877—Demurrer filed. Dec. 1, 1877—Demurrer overruled. Dec. 1, 1877—Defendant plead not guilty. Dec. 8, 1877—Tried and convicted. Dec. 17, 1877—Sentenced to State Prison for life. Jan. 28, 1878—Notice of appeal filed.	Feb. 12, 1878—Transcript filed. April 22, 1878—Judgment reversed.	May 17, 1878—Remittitur issued.

10,337—The People, etc., Respondent, vs. Betsy Van De-Beer, Appellant.	County Court, County of Santa Barbara.	Criminal.	Indictment—Administering poison with criminal intent.	Dec. 3, 1877—Indictment found. Dec. 4, 1877—Demurrer filed. Dec. 4, 1877—Demurrer overruled. Dec. 4, 1877—Defendant plead not guilty. Dec. 12, 1877—Tried and convicted. Dec. 18, 1877—Sentenced to ten years in State Prison. Dec. 22, 1877—Notice of appeal filed.	March 1, 1878—Transcript filed. —, 1878—Judgment reversed.	—, 1878—Remittitur issued.
10,339—The People, etc., Appellant, vs. Frederick Schroder, Respondent.	Tenth District Court, County of Sutter.	Criminal.	Indictment—Murder.	Jan. 10, 1877—Indictment found. March 8, 1877—Tried and convicted of manslaughter. March 26, 1877—New trial granted. May 19, 1877—Notice of appeal filed.	March 2, 1878—Transcript filed. April 10, 1878—Judgment affirmed.	May 5, 1878—Remittitur issued.
10,340—The People, etc., Respondent, vs. Maggie Brown, Appellant.	County Court, County of Sacramento.	Criminal.	Indictment—Grand larceny.	May 11, 1877—Indictment found. May 19, 1877—Defendant plead not guilty. June 25, 1877—Tried and convicted. June 27, 1877—Sentenced to two years in State Prison. June 27, 1877—Notice of appeal filed.	March 6, 1878—Transcript filed. April 10, 1878—Respondent's points filed. April 11, 1878—Judgment reversed.	April 15, 1878—Remittitur issued.
10,342—The People, etc., Respondent, vs. James McKeller, Appellant.	County Court, County of San Joaquin.	Criminal.	Indictment—Burglary.	May 31, 1877—Indictment found. May 31, 1877—Plead not guilty. Feb. 16, 1878—Tried and convicted of burglary in first degree. Feb. 23, 1878—Sentenced to three and one-half years in State Prison. Feb. 23, 1878—Notice of appeal filed.	March 9, 1878—Transcript filed. April 10, 1878—Respondent's points filed. April 11—Judgment reversed.	May 6, 1878—Remittitur issued.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,343—The People, etc., Respondent, vs. Sotello and Acosta (Acosta Appellant).	County Court, County of Los Angeles.	Criminal.	Indictment—Grand larceny.	Jan. 7, 1878—Indictment found. Jan. 16, 1878—Demurrer filed. Jan. 16, 1878—Demurrer overruled. Jan. 16, 1878—Defendant plead not guilty. Jan. 21, 1878—Tried and convicted. Feb. 1, 1878—Sentenced to five years in State Prison. Feb. 28, 1878—Notice of appeal filed.	March 11, 1878—Transcript filed. April 10, 1878—Respondent's points filed. April —, 1878—Appellant's points filed. April 29, 1878—Judgment affirmed.	May 24, 1878—Remittitur issued.
10,344—The People, etc., Respondent, vs. George Butts, Appellant.	Fourteenth District Court, County of Nevada.	Criminal.	Indictment—Murder.	Nov. 5, 1877—Indictment found. Jan. 10, 1878—Defendant plead not guilty. Jan. 10, 1878—Tried and convicted of murder in first degree. March 13, 1878—Notice of appeal filed.	March 19, 1878—Transcript filed. April 30, 1878—Respondent's brief filed. April 30, 1878—Appellant's brief filed. —, 1878—Judgment affirmed.	—, 1878—Remittitur issued.
10,345—The People, etc., Respondent, vs. Eliza W. Gibbs, Appellant.	Eighth District Court, County of Humboldt.	Criminal.	Indictment—Murder.	Nov. 7, 1877—Indictment found. Dec. 10, 1877—Plead not guilty. Jan. 28, 1878—Tried and convicted of murder in second degree. Feb. 9, 1878—Sentenced to fifteen years in State Prison. March 5, 1878—Notice of appeal filed.*	March 25, 1878—Transcript filed. April 10, 1878—Respondent's points filed.	

* REMARKS.—Pending the appeal in this case, defendant was shot and killed while attempting to break jail at Eureka, Humboldt County.

10,347—The People, etc., Respondent, vs. Fong Ah Tuck, Appellant.	Sixth District Court, County of Sacramento.	Criminal.	Indictment—Murder.	May 18, 1877—Indictment found. May 18, 1877—Defendant plead not guilty. July 9, 1877—Tried and convicted of murder in second degree. July —, 1877—Sentenced to thirteen years in State Prison. July 15, 1877—Notice of appeal filed.	March 28, 1878—Transcript filed. July —, 1878—Argued and submitted. July 22, 1878—Judgment affirmed.	Aug. 17, 1878—Remittitur issued.
10,348—The People, etc., Respondent, vs. James P. Bevans, Appellant.	County Court, County of Monterey.	Criminal.	Indictment—Grand larceny.	April 19, 1877—Indictment found. June 30, 1877—Plead not guilty. Feb. 26, 1878—Tried and convicted. March 6, 1878—Sentenced to one year in State Prison. April 2, 1878—Notice of appeal filed.*	April 11, 1878—Transcript filed. July —, 1878—Argued and submitted. July 9, 1878—Judgment affirmed.	Aug. 4, 1878—Remittitur issued.
10,349—The People, etc., Appellant, vs. John C. Platt, Respondent.	County Court, Santa Barbara.	Criminal.	Indictment—Embezzlement of public moneys.	March 12, 1878—Indictment found. April 8, 1878—Demurrer filed. April 9, 1878—Demurrer sustained. April 9, 1878—Notice of appeal filed.	April 22, 1878—Transcript filed. Nov. 12, 1878—Argued and judgment affirmed.	Dec. 9, 1878—Remittitur issued.
10,352—The People, etc., Respondent, vs. George S. Bell, Appellant.	Thirteenth District Court, County of Merced.	Criminal.	Indictment—Murder.	March 9, 1878—Indictment found. March 9, 1878—Plead not guilty. March 29, 1878—Tried and convicted of manslaughter. March —, 1878—Sentenced to — years in State Prison. March 28, 1878—Notice of appeal filed.	May 25, 1878—Transcript filed. July —, 1878—Argued and submitted. July 22, 1878—Judgment reversed.	Aug. 17, 1878—Remittitur issued.
The People, etc., ex rel. A. J. Bryant, vs. S. W. Holland, et al.	— District Court, City and County of San Francisco.	Civil.	Complaint—An action to abate a nuisance, Lafayette Park, City and County of San Francisco.	Petition filed February 15, 1878, and leave granted to commence proceedings in the name of the People of the State.		

* REMARKS.—This is the second appeal in this case.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
The People, etc., ex rel. Matthew Reed, vs. Chas. Roberts.	Twenty-second District Court, County of Sonoma.	Civil.	Complaint—An action to test the validity of a State patent.	Petition filed April 6, 1878, and leave granted to commence proceedings in the name of the People.		
The People, etc., ex rel. S. A. Bishop, Plaintiff, vs. Jacob Rich, et al., Defendants.	— District Court, County of Santa Clara.	Civil.	Complaint—An action to try the right of defendant to build and own a street railroad in certain streets of the City of San José.	April 2, 1878—Petition filed, and leave granted to institute proceedings in the name of the People.		
The People, etc., ex rel. J. L. Miles, Plaintiff, vs. Board of Supervisors of Solano County, Defendant.	Seventh District Court, County of Solano.	Civil.	Complaint—An action to obtain a writ of review to inquire into the action of said Board of Supervisors ordering the repairs, and drawing a warrant therefor, of a certain bridge in Napa County.	May 18, 1878—Petition filed, and leave granted to commence suit in the name of the People.		
10,353—The People, etc., Respondent, vs. Juan Felix, Appellant.	County Court, County of San Benito.	Criminal.	Indictment—Grand larceny.	May 14, 1878—Indictment found. May 16, 1878—Defendant plead not guilty. May 17, 1878—Tried and convicted. May 18, 1878—Sentenced to two years in State Prison. June 1, 1878—Notice of appeal filed.	June 11, 1878—Transcript filed. July —, 1878—Judgment reversed.	Aug. —, 1878—Remittitur issued.

10,354—The People, etc., Respondent, vs. Francisco Arera, Appellant.	County Court, County of San Bernardino.	Criminal.	Indictment—Grand larceny.	March 28, 1878—Indictment found. May 13, 1878—Defendant plead not guilty. June 4, 1878—Tried and convicted. June 7, 1878—Sentenced to one year in State Prison. June 7, 1878—Notice of appeal filed.	June 17, 1878—Transcript filed. July —, 1878—Judgment affirmed.	Aug. 23, 1878—Remittitur issued.
10,355—The People, etc., Respondent, vs. Charles E. White, Appellant.	County Court, County of Shasta.	Criminal.	Indictment—Burglary.	Jan. 24, 1878—Indictment found. Feb. 11, 1878—Defendant plead not guilty. March 6, 1878—Tried and convicted. April 19, 1878—Sentenced to one year in State Prison. April 19, 1878—Notice of appeal filed.	June 27, 1878—Transcript filed. Nov. 12, 1878—Arrested and submitted. Nov. 20, 1878—Judgment affirmed.	Dec. 15, 1878—Remittitur issued.
10,356—The People, etc., Respondent, vs. William Collins, Appellant.	County Court, County of Colusa.	Criminal.	Indictment—Burglary.	April 6, 1878—Indictment found. April 9, 1878—Demurrer filed. April 9, 1878—Defendant plead not guilty. April 13, 1878—Tried and convicted. April 20, 1878—Sentenced to eleven years in State Prison. April 20, 1878—Notice of appeal filed.	July 2, 1878—Transcript filed. July —, 1878—Judgment reversed.	Aug. —, 1878—Remittitur issued.
The People ex rel. Jo Hamilton, Plaintiff, vs. Sherrod Williams et al., Defendants.	Sixth District Court, County of Sacramento.	Civil.	Complaint—An action to contest the legality of Swamp Land District No. 8.	July 6, 1878—Petition filed and leave granted to commence suit in the name of the People.		
The People ex rel. Board of Supervisors of Sonoma County, Plaintiff, vs. The Pacific Reclamation Company, Defendant.	— District Court, County of Sonoma.	Civil.	Complaint—An action to try the right of defendant to build a dam across a certain slough.	Aug. 10, 1878—Petition filed and leave granted to commence suit in the name of the People.		

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,364—The People, etc., Respondent, vs. William A. Fine, Appellant.	County Court, County of Ventura.	Civil.	Indictment—Assault to commit murder.	June 14, 1877—Indictment found. Oct. 3, 1877—Defendant plead not guilty. June 10, 1878—Tried and convicted. June 22, 1878—Sentenced to three years in State Prison. Aug. 22, 1878—Notice of appeal filed.	Sept. 3, 1878—Transcript filed. Oct. 17, 1878—Judgment reversed.	Nov. 12, 1878—Remittitur issued.
10,365—The People, etc., Respondent, vs. Joseph Philips, Appellant.	County Court, County of Marin.	Criminal.	Indictment—Grand larceny.	March 5, 1878—Indictment found. March 7, 1878—Defendant plead not guilty. March 12, 1878—Tried and convicted. March 16, 1878—Sentenced to two and a half years in State Prison. March 19, 1878—Notice of appeal filed.	Sept. 14, 1878—Transcript filed. Oct. 15, 1878—Judgment affirmed.	Nov. 10, 1878—Remittitur issued.
10,367—The People, etc., Respondent, vs. Geo. Carlton, Appellant.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Burglary.	March 19, 1878—Indictment found. April 4, 1878—Defendant plead not guilty. May 29, 1878—Tried and convicted. June 3, 1878—Sentenced to three years in State Prison. July 3, 1878—Notice of appeal filed.	July 9, 1878—Transcript filed. Nov. 12, 1878—Judgment affirmed.	Dec. 7, 1878—Remittitur issued.
10,368—The People, etc., Respondent, vs. Emanuel Borghon, Appellant.	County Court, County of San Joaquin.	Criminal.	Indictment—Robbery.	Nov. 24, 1877—Indictment found. Nov. 30, 1877—Plead not guilty. Feb. 15, 1878—Tried and convicted. Feb. 23, 1878—Sentenced to seven years in State Prison. Feb. 23, 1878—Notice of appeal filed.	July 9, 1878—Transcript filed. Nov. 12, 1878—Judgment affirmed.	Dec. 12, 1878—Remittitur issued.

10,360—The People, etc., Respondent, vs. Chas. W. Aubrey, Appellant.	County Court, County of Placer.	Criminal.	Indictment—Assault to commit murder.	May 30, 1878—Indictment found. June 5, 1878—Defendant plead not guilty. June 28, 1878—Fried and convicted of an assault with a deadly weapon. Aug. 5, 1878—Sentenced to imprisonment in County Jail of Placer County for one year. Aug. 5, 1878—Notice of appeal filed.	July 16, 1878—Transcript filed. Nov. 11, 1878—Notice to dismiss appeal filed. —, 1878—Appeal dismissed.	Dec. 7, 1878—Remittitur issued.
10,367—The People, etc., Respondent, vs. Juan Felix, Appellant.	County Court, County of San Benito.	Criminal.	Indictment—Grand larceny.	Aug. 21, 1878—Indictment found. Sept. 19, 1878—Plead not guilty; that he had been acquitted of the same offense; that he had once been convicted for the same offense. Sept. 19, 1878—Fried and convicted. Sept. 21, 1878—Sentenced to eighteen months in State Prison. Sept. 27, 1878—Notice of appeal filed.*	Oct. 5, 1878—Transcript filed. Nov. 12, 1878—Judgment affirmed.	Dec. 7, 1878—Remittitur issued.
10,368—The People, etc., Respondent, vs. Wm. Burton, Appellant.	County Court, County of San Benito.	Criminal.	Indictment—Grand larceny.	Aug. 21, 1878—Indictment found. —, 1878—Defendant plead not guilty. Sept. 24, 1878—Fried and convicted. Oct. 2, 1878—Notice of appeal filed.	Oct. 5, 1878—Transcript filed. Nov. 12, 1878—Judgment affirmed.	Dec. 7, 1878—Remittitur issued.
10,370—The People, etc., Respondent, vs. Jacob Gurr, Appellant.	County Court, County of Lake.	Criminal.	Indictment—Assault to commit rape.	May 17, 1878—Indictment found. May 22, 1878—Demurrer filed. May 22, 1878—Demurrer overruled. Oct. 1, 1878—Notice of appeal filed.†	Oct. 14, 1878—Transcript filed. Nov. 12, 1878—Argued and submitted. Sept. 13, 1879—Judgment affirmed.	

* REMARKS.—This is the second appeal in this case.

† REMARKS.—No verdict or account of trial or judgment comes with the record of this case.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,371—The People, etc., Respondent, vs. Edward McGunge, Appellant.	County Court, County of Lake.	Criminal.	Indictment—Grand larceny.	Jan. 12, 1878—Indictment found. May 15, 1878—Plead not guilty. May 27, 1878—Tried and convicted. May 27, 1878—Sentenced to three and a half years in State Prison. June 3, 1878—Notice of appeal filed.	Oct. 14, 1878—Transcript filed. Nov. 12, 1878—Judgment affirmed.	Dec. 7, 1878—Remittitur issued.
10,372—The People, etc., Respondent, vs. David Carrick, Appellant.	Ninth Judicial District, County of Siskiyou.	Criminal.	Indictment—Murder.	May 19, 1877—Indictment found. May 27, 1877—Demurrer filed. May 30, 1877—Demurrer overruled. May 31, 1877—Defendant plead not guilty. May 31, 1877—Tried and convicted of murder, first degree; imprisonment for life fixed. Nov. 2, 1877—Sentenced. Nov. 3, 1877—Notice of appeal filed.	Oct. 19, 1878—Transcript filed.	
10,373—The People, etc., Respondent, vs. James Baza, Appellant.	Second District Court, County of Butte.	Criminal.	Indictment—Murder.	Jan. 9, 1878—Indictment found. Feb. 5, 1878—Defendant plead not guilty. May 17, 1878—Tried and convicted of murder in second degree.	Oct. 19, 1878—Transcript filed. Nov. 12, 1878—Argued and submitted.	
10,374—The People, etc., Respondent, vs. James Whitney, Appellant.	County Court, County of Siskiyou.	Criminal.	Indictment—Assault to commit murder.	Sept. 14, 1877—Indictment found. Sept. 17, 1877—Plead not guilty. Nov. 5, 1877—Tried and convicted. Nov. 8, 1877—Sentenced to ten years in State Prison. Oct. 1, 1878—Notice of appeal filed.	Oct. 21, 1878—Transcript filed. Nov. 12, 1878—Submitted on points on file. March —, 1879—Judgment affirmed.	—, 1879—Remittitur issued.

10,375—The People, etc., Respondent, vs. W. B. Johnson, Appellant.	County Court, County of Humboldt.	Criminal.	Indictment—Assault to commit murder.	Aug. 28, 1878—Indictment found. Aug. 29, 1878—Defendant plead not guilty. Sept. 5, 1878—Tried and convicted of an assault with a deadly weapon. Sept. 12, 1878—Sentenced to one year in State Prison. Sept. 27, 1878—Notice of appeal filed.	Oct. 26, 1878—Transcript filed. Nov. 12, 1878—Submitted on points on file. Nov. 20, 1878—Judgment affirmed.	Dec. 16, 1878—Remittitur issued.
10,376—The People, etc., Respondent, vs. F. A. Sprague, Appellant.	First District Court, County of Ventura.	Criminal.	Indictment—Murder.	June 8, 1878—Indictment found. July 3, 1878—Plead not guilty. —, 1878—Tried and convicted of murder in first degree. —, 1878—Sentenced to be hanged.	Oct. 26, 1878—Transcript filed. Nov. 20, 1878—Argued and submitted. Mar. 10, 1878—Judgment affirmed. April 3, 1879—Petition for rehearing filed. —, 1879—Judgment affirmed.	—, 1879—Remittitur issued.
10,379—The People, etc., Respondent, vs. F. A. Sprague, Appellant.					Nov. 14, 1878—Transcript filed. Nov. 20, 1878—Argued and submitted. Mar. 4, 1879—Order affirmed. —, 1879—Petition for rehearing filed.*	
10,385—F. A. Sprague, Petitioner, vs. Eugene Fawcett, District Judge, Respondent.	Supreme Court.		Petition for writ of mandate, to compel respondent to certify to a bill of exceptions.		Nov. 27, 1878—Petition filed. —, 1879—Petition denied.	

* REMARKS.—This is the same case as above, except that this is an appeal from an order refusing to certify to a bill of exceptions.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,363—The People, etc., Appellant, vs. George W. Abbott, Respondent.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Grand larceny.	May 4, 1878—Indictment found. May 6, 1878—Plead not guilty. May 28, 1878—Tried and convicted. July 20, 1878—New trial granted. July 22, 1878—Notice of appeal filed.	Aug. 30, 1878—Transcript filed. Sept. 9, 1878—Appellant's points filed. Sept. 9, 1878—Respondent's points filed. Dec. 2, 1878—Judgment reversed.	Dec. 27, 1878—Remittitur issued.
10,377—The People, etc., Respondent, vs. Pascol Varnum, Appellant.	Fourteenth District Court, County of Placer.	Criminal.	Indictment—Murder.	March 7, 1878—Indictment found. May 6, 1878—Plead not guilty. Aug. 14, 1878—Tried and convicted of murder in second degree. Aug. 22, 1878—Sentenced to fifteen years in State Prison. Oct. 28, 1878—Notice of appeal filed.	Nov. 5, 1878—Transcript filed. Sept. 13, 1879—Judgment affirmed.	Oct. 9, 1879—Remittitur issued.
10,380—The People, etc., Respondent, vs. Fernando Estrada, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment—Assault with intent to commit rape.	Sept. 26, 1878—Indictment found. Sept. 30, 1878—Demurrer filed. Sept. 30, 1878—Demurrer overruled. Sept. 30, 1878—Defendant plead not guilty. Oct. 9, 1878—Tried and convicted. Oct. 14, 1878—Sentenced to five years in State Prison. Nov. 14, 1878—Notice of appeal filed.	Nov. 23, 1878—Transcript filed. Sept. 24, 1879—Judgment affirmed.	Oct. 20, 1879—Remittitur issued.
10,381—The People, etc., Respondent, vs. Ah Yute, Appellant.	Fifteenth District Court, City and County of San Francisco.	Criminal.	Indictment—Murder.	May 4, 1878—Indictment found. Sept. 4, 1878—Plead not guilty. Oct. 3, 1878—Tried and convicted of murder in first degree. Nov. 2, 1878—Sentenced to be hanged. Nov. 8, 1878—Notice of appeal filed.	Nov. 27, 1878—Transcript filed. Jan. —, 1879—Argument and submitted. Sept. 13, 1878—Judgment affirmed. Oct. 22, 1879—Rehearing granted.	

10,383—The People, etc., Respondent, vs. Conelius Casey, Appellant.	Sixteenth District Court, County of Mono.	Criminal.	Indictment—Murder.	Sept. 12, 1878—Indictment found. Oct. 24, 1878—Plead not guilty. Oct. 28, 1878—Tried and convicted of murder in first degree. Nov. 2, 1878—Sentenced to be hanged. Dec. 17, 1878—Notice of appeal filed.	Dec. 14, 1878—Transcript filed. Dec. 26, 1878—Supplemental transcript filed. Jan. —, 1879—Argued and submitted. March 28, 1879—Judgment reversed.	April 23, 1879—Remittitur issued.
10,385—The People, etc., Respondent, vs. John Lechy, Appellant.	County Court, County of Lassen.	Criminal.	Indictment—Embezzlement.	Nov. 6, 1878—Indictment found. Nov. 9, 1878—Plead not guilty. Nov. 9, 1878—Tried and convicted. Nov. 30, 1878—Sentenced to five years in State Prison. Nov. 30, 1878—Notice of appeal filed.	Dec. 15, 1878—Transcript filed. Jan. —, 1879—Argued and submitted. Sept. 13, 1879—Judgment affirmed. Oct. 22, 1879—Re-hearing granted.	
10,386—The People, etc., Appellant, vs. H. J. Palmer, Respondent.	County Court, County of Sacramento.	Criminal.	Indictment—Making false entries in the books of account of a corporation.	Nov. 6, 1878—Indictment found. Nov. 13, 1878—Demurrer filed. Nov. 23, 1878—Demurrer sustained. Nov. 30, 1878—Notice of appeal filed.	Dec. 20, 1878—Transcript filed. April —, 1879—Argued and submitted. Sept. 13, 1879—Judgment affirmed.	Oct. 9, 1879—Remittitur issued.
10,387—The People, etc., Appellant, vs. H. J. Palmer, Respondent.	County Court, County of Sacramento.	Criminal.	Indictment—Embezzlement.	Nov. 6, 1878—Indictment found. Nov. 13, 1878—Demurrer filed. Nov. 23, 1878—Demurrer sustained. Nov. 30, 1878—Notice of appeal filed.	Dec. 20, 1878—Transcript filed. April —, 1879—Argued and submitted.	
10,389—The People, etc., Respondent, vs. John Montgomery, Appellant.	Eighth District Court, County of Humboldt.	Criminal.	Indictment—Murder.	Oct. 15, 1877—Indictment found. April 15, 1878—Tried and convicted of murder in second degree. April 12, 1878—Sentenced to twelve years in State Prison. June 10, 1878—Notice of appeal filed.	Dec. 30, 1878—Transcript filed. June 2, 1879—Judgment affirmed.	July 1, 1879—Remittitur issued.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,390—The People, etc., Respondent, vs. Edward Hicks, Appellant.	Fifteenth District Court, City and County of San Francisco.	Criminal.	Indictment—Murder.	Jan. 5, 1878—Indictment found. Feb. 18, 1878—Plead not guilty. Feb. 25, 1878—Tried and convicted of murder in the second degree. March 15, 1878—Sentenced to imprisonment for life. Dec. 24, 1878—Notice of appeal filed.	Dec. 30, 1878—Transcript filed. March 24, 1878—Judgment affirmed.	April 18, 1878—Remittitur issued.
The People of the State of California ex rel. Jo Hamilton, Attorney-General, Plaintiff, vs. Mary Quinn, et al., Defendants.	Fourteenth District Court, County of Placer.	Civil.	Complaint—An action to obtain a decree of perpetual injunction, to prevent defendants from taking stone from State land at Rocklin.	Jan. 11, 1878—Complaint filed and temporary writ of injunction issued.		
10,391—The People, etc., Respondent, vs. José Soto, Appellant.	County Court, County of Contra Costa.	Criminal.	Indictment.		Jan. 10, 1879—Transcript filed. Jan. 15, 1879—Arraigned and submitted. March 10, 1879—Judgment affirmed.	April 5, 1879—Remittitur issued.
Mary Beale, Plaintiff, vs. E. F. Beale et al., Defendants.	Twenty-third District Court, City and County of San Francisco.	Civil.	Complaint—An action to appoint a trustee of an expressed trustee in place of trustee deceased.	Jan. 24, 1879—Complaint filed. Jan. 31, 1879—Answer filed.		

10,396.—The People, etc., Respondent, vs. John T. Curlee, Appellant.	First District Court, County of Ventura.	Criminal.	Indictment—Murder.	June 8, 1878—Indictment found. July 3, 1878—Plead not guilty. July 24, 1878—Tried and found guilty of murder in first degree. Aug. 8, 1878—Sentenced to imprisonment for life in State Prison.	Jan. 2, 1879—Transcript filed. April 2, 1879—Argued and submitted. Sept. 25, 1879—Judgment reversed.	Oct. 16, 1879—Remittitur issued.
10,399.—The People, etc., Respondent, vs. John Hersy, Appellant.	Tenth District Court, County of Colusa.	Criminal.	Indictment—Murder.	Oct. 29, 1877—Indictment found. Dec. 23, 1877—Plead not guilty. April 25, 1878—Tried and found guilty of murder in second degree. May 8, 1878—Sentenced to imprisonment in State Prison.	Feb. 3, 1879—Transcript filed. May 19, 1879—Judgment reversed.	Remittitur issued forthwith.
10,405.—The People, etc., Respondent, vs. James J. Kerrick, Appellant.	Thirteenth District Court, County of Tuolumne.	Criminal.	Indictment—Murder.	March 7, 1878—Indictment found. May 21, 1878—Plead not guilty. Oct. 1, 1878—Tried and found guilty of murder in first degree. Oct. 7, 1878—Sentenced to imprisonment for life.	Feb. 28, 1879—Transcript filed. Oct. 13, 1879—Argued and submitted.	
10,406.—The People, etc., Respondent, vs. Abner Gow, Appellant.	County Court, County of Tuolumne.	Criminal.	Indictment—Assault with intent to commit murder.	Sept. 3, 1878—Indictment found. Sept. 5, 1878—Plead not guilty. Sept. 11, 1878—Tried and convicted as charged. Sept. 20, 1878—Sentenced to four years in State Prison.	March 1, 1879—Transcript filed. April —, 1879—Argued and submitted. Sept. 13, 1879—Judgment affirmed. Oct. 9, 1879—Judgment set aside and cause submitted on briefs on file. Oct. 10, 1879—Judgment reversed.	
10,400.—The People, etc., Respondent, vs. Peter Smith, Appellant.	Tenth District Court, County of Colusa.	Criminal.	Indictment—Murder.	Oct. 29, 1877—Indictment found. Dec. 13, 1877—Plead not guilty. Dec. 13, 1877—Tried and convicted of manslaughter. Jan. 18, 1878—Sentenced to seven years in State Prison.	Feb. 15, 1879—Transcript filed. May —, 1879—Argued and submitted. Oct. 30, 1879—Judgment affirmed.	

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,392—The People, etc., Respondent, vs. Charlie Taing, Appellant.	Tenth District Court, County of Colusa.	Criminal.	Indictment—Murder.	Oct. 23, 1878—Indictment found. Dec. 4, 1878—Plead not guilty. Dec. 17, 1878—Tried and convicted of murder in first degree. Jan. 6, 1879—Sentenced to be hanged.	Jan. 14, 1879—Transcript filed. May 30, 1879—Appellant's points filed. June 4, 1879—Respondent's points filed. Sept. 24, 1879—Judgment affirmed.	
10,393—The People, etc., Respondent, vs. George T. Bell, Appellant.	Thirteenth District Court, County of Merced.	Criminal.	Indictment—Murder.	March 9, 1878—Indictment found. March 9, 1878—Plead not guilty. March 20, 1878—Tried and convicted of manslaughter. Nov. 23, 1878—Tried a second time and convicted of manslaughter. —, 1878—Sentenced to seven years in State Prison.*	Jan. 17, 1879—Transcript filed. April —, 1879—Argued and submitted. Sept. 13, 1879—Judgment affirmed.	Oct. 9, 1879—Remittitur issued.
10,407—The People, etc., Respondent, vs. — Coch, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment—Burglary.		March 11, 1879—Transcript filed. April —, 1879—Argued and submitted. Sept. 24, 1879—Judgment affirmed.	
10,408—The People, etc., Respondent, vs. George Hilton, Appellant.	Tenth District Court, County of Colusa.	Criminal.	Indictment—Murder.	Oct. 20, 1877—Indictment found. Dec. 23, 1877—Plead not guilty. April 24, 1878—Tried and convicted of murder in second degree. May 18, 1878—Sentenced to fifteen years in State Prison.	March 14, 1879—Transcript filed. Oct. 24, 1879—Judgment affirmed.	

* REMARKS.—This is the second appeal in this case.

10,409—The People, etc., Respondent, vs. Troy Dye, Appellant.	Sixth District Court, County of Sacramento.	Criminal.	Indictment—Murder.	Oct. 29, 1878—Indictment found. Nov. 4, 1878—Plead not guilty. Jan. 8, 1879—Tried and convicted of murder in first degree. Jan. 24, 1879—Death sentence passed.	March 14, 1879—Transcript filed. April —, 1879—Argued and submitted. April 16, 1879—Judgment affirmed.	Remittitur issued forthwith.
10,410—The People, etc., Respondent, vs. Edward Anderson, Appellant.	Sixth District Court, County of Sacramento.	Criminal.	Indictment—Murder.	Oct. 29, 1878—Indictment found. Nov. 4, 1878—Plead not guilty. Jan. 11, 1879—Tried and found guilty of murder in first degree. Jan. 24, 1879—Death sentence passed.	March 14, 1879—Transcript filed. April —, 1879—Argued and submitted. April 16, 1879—Judgment affirmed.	Remittitur issued forthwith.
10,411—The People, etc., Respondent, vs. — Cantlow, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment.		March 14, 1879—Transcript filed. April —, 1879—Argued and submitted. Sept. 24, 1879—Judgment affirmed.	
10,412—The People, etc., Respondent, vs. Ah Ton, Appellant.	Eleventh District Court, County of Calaveras.	Criminal.	Indictment—Murder.	Aug. 7, 1878—Indictment found. —, 1878—Plead not guilty. Jan. 28, 1879—Tried and convicted of murder in the first degree. Feb. 3, 1879—Sentenced to be hanged.	March 18, 1879—Transcript filed. Nov. 11, 1879—Argued and submitted.	
10,413—The People, etc., Respondent, vs. — Cope, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment.		March 22, 1879—Transcript filed. April —, 1879—Argued and submitted. Sept. 24, 1879—Judgment affirmed.	

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,414—The People, etc., Respondent, vs. A. P. and Thomas Gipson, Appellants.	Ninth District Court, County of Shasta.	Criminal.	Indictment—Murder.	Jan. 24, 1879—Indictment found. March 14, 1879—Plead not guilty. May 3, 1879—Tried and A. P. Gipson found guilty of murder in first degree, and penalty fixed at imprisonment for life; and Thomas Gipson found guilty of murder in second degree. May 13, 1879—A. P. Gipson sentenced to imprisonment for life; and Thomas Gipson for twenty years.	March 24, 1879—Transcript filed. Sept. 24, 1879—Judgment affirmed.	
10,415—The People, etc., Respondent, vs. Wm. J. Yeakum, Appellant.	Sixteenth District Court, County of Kern.	Criminal.	Indictment—Murder.	May 10, 1878—Indictment found. —, 1878—Plead not guilty. —, 1878—Plead former trial and acquittal. Feb. 22, 1879—Tried and found guilty of murder in first degree. March 20, 1879—Sentenced to be hanged.*	April 10, 1879—Transcript filed. May 24, 1879—Judgment affirmed.	
10,416—The People, etc., Respondent, vs. R. J. Shaw, Appellant.	Twenty-first District Court, County of Plumas.	Criminal.	Indictment—Murder.	Sept. 5, 1878—Indictment found. Sept. 14, 1878—Demurror filed. Sept. 14, 1878—Plead not guilty. —, 1878—Tried and convicted of murder in second degree. Oct. 5, 1878—Sentenced for life in State Prison.	April 19, 1879—Transcript filed. May 13, 1879—Judgment affirmed.	June 7, 1879—Remittitur issued.

* REMARKS.—The defendant in this case was hanged by a mob in Kern County, upon receipt of the news of the reversal of his case by the Supreme Court.

10,418—The People, etc., Respondent, vs. H. Tantsky, Appellant.	County Court, County of Alameda.	Criminal.	Indictment—Perjury.	Jan. 18, 1879—Indictment found. Jan. 27, 1879—Demurrer filed. Jan. 27, 1879—Demurrer overruled. Jan. 27, 1879—Defendant plead not guilty. Feb. 20, 1879—Tried and convicted. March 13, 1879—Sentenced to three years in State Prison.	May 10, 1879—Transcript filed. July 16, 1879—Argued and submitted. Sept. 24, 1879—Judgment affirmed.
10,419—The People, etc., Respondent, vs. Marion F. Smith, Appellant.	County Court, County of San Bernardino.	Criminal.	Indictment—Arson.	March 7, 1879—Indictment found. March 11, 1879—Plead not guilty. March 14, 1879—Tried and convicted. March 17, 1879—Sentenced to twelve years in State Prison.	May 13, 1879—Transcript filed. May 13, 1879—Submitted on points on file. Sept. 25, 1879—Judgment affirmed.
10,420—The People, etc., Respondent, vs. Wm. A. Dever, Appellant.	Twenty-second District Court, County of Marin.	Criminal.	Indictment—Murder.	March 5, 1879—Indictment found. March 18, 1879—Plead not guilty. March 24, 1879—Tried and found guilty of murder in first degree. April 10, 1879—Sentenced to be hanged.	May 28, 1879—Transcript filed. July 17, 1879—Argued and judgment affirmed.
10,422—The People, etc., Respondent, vs. Corlas Moreno, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment—Burglary.	March 2, 1879—Indictment found. March 24, 1879—Demurrer filed. March 24, 1879—Demurrer overruled. March 24, 1879—Defendant plead not guilty. March 26, 1879—Tried and convicted. April 2, 1879—Sentenced to one and one-half years in State Prison.	May 5, 1879—Transcript filed. July 18, 1879—Judgment affirmed.
10,423—The People, etc., Respondent, vs. Wong-chu Shutt, Appellant.	Seventeenth District Court, County of Los Angeles.	Criminal.	Indictment—Murder.	Sept. 18, 1877—Indictment found. May —, 1878—Convicted of murder in first degree. June 10, 1878—Sentenced for life in State Prison.*	June 14, 1879—Transcript filed. July 17, 1879—Submitted on points on file. Sept. 29, 1879—Judgment affirmed.

*REMARKS.—This is the second appeal in this case.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,424—The People, etc., Appellant, vs. Catherine Closser, Respondent.	County Court, County of Santa Clara.	Criminal.	Indictment—Murder.	May 24, 1879—Indictment found. May 28, 1879—Demurrer filed. June 2, 1879—Demurrer sustained.	June 19, 1879—Transcript filed. July 18, 1879—Judgment reversed.	Remittitur forthwith.
10,425—The People, etc., Respondent, vs. Virginio Hernandez, Appellant.	County Court, County of Santa Clara.	Criminal.	Indictment—Arson.	May 20, 1879—Indictment found. May 22, 1879—Plead not guilty. May 29, 1879—Tried and convicted of arson in second degree. June 7, 1879—Sentenced to four years in State Prison.	June 19, 1879—Transcript filed. July 18, 1879—Submitted on briefs on file. Sept. 29, 1879—Judgment affirmed.	
10,426—The People, etc., Respondent, vs. William Fugate, Appellant.	County Court, County of Merced.	Criminal.	Indictment—Assault with intent to commit murder.	April 11, 1879—Indictment found. —, 1879—Plead not guilty. —, 1879—Tried and convicted as charged. —, 1879—Sentenced to — years in State Prison.	July 1, 1879—Transcript filed. Nov. 11, 1879—Argued and submitted.	
10,427—The People, etc., Respondent, vs. Ah Chung, Appellant.	First District Court, County of Santa Barbara.	Criminal.	Indictment—Murder.	Dec. 5, 1878 — Indictment found. April 18, 1879 — Demurrer filed. April 18, 1879—Demurrer overruled. April 30, 1879—Tried and convicted of murder in first degree. —, 1879—Sentenced to State Prison for life.	July 2, 1879—Transcript filed. July 18, 1879—Judgment affirmed. July 26, 1879—Petition for rehearing filed. Nov. 11, 1879—Argued and submitted.	

10,428—The People, etc., Respondent, vs. Bruce Creighton, Appellant.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Burglary.	March 14, 1879—Indictment found. March 24, 1879—Plead not guilty. April 4, 1879—Tried and convicted of burglary in first degree. April 22, 1879—Sentenced to five years in State Prison.	July 5, 1879—Transcript filed. July 5, 1879—Argued and submitted. Sept. 13, 1879—Judgment affirmed.	
10,429—The People, etc., Respondent, vs. James Hunter and Bruce Creighton, Appellants.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Robbery.	Nov. 25, 1878—Indictment found. Dec. 7, 1878—Hunter plead not guilty. Dec. 9, 1878—Creighton plead not guilty. April 11, 1879—Creighton tried and convicted. April 13, 1879—Hunter tried and convicted. April 22, 1879—Creighton sentenced to five years in State Prison. April 22, 1879—Hunter sentenced for life in State Prison.	July 5, 1879—Transcript filed. July —, 1879—Argued and submitted. Aug. 3—Judgment affirmed.	Aug. 31, 1879—Remittitur issued.
10,430—The People, etc., Respondent, vs. Charly Quong, Appellant.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Robbery.	July 31, 1878—Indictment found. Sept. 3, 1878—Plead not guilty. Jan. 16, 1879—Tried and convicted. Feb. 1, 1879—Sentenced to four years and nine months in State Prison.	July 5, 1879—Transcript filed. Nov. 11, 1879—Judgment affirmed.	
The People, etc., ex rel. John Warner et al., Plaintiffs, vs. The Diamond Creek Gold and Silver Mining Company, Defendant.	— District Court, City and County of San Francisco.	Civil.	Complaint—An action to inquire into the legality of the right of defendant to act as a corporation.	Petition filed and leave granted to commence suit in the name of the People, May 3, 1879.		

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution, and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
The People, etc., ex rel. George Williams, Plaintiff, vs. Board of Supervisors of Santa Barbara County, Defendant.	First District Court, County of Santa Barbara.	Civil.	Complaint—An action to try the right of defendants to discontinue a certain road.	Petition filed and leave granted to commence suit in the name of the People, Nov. 22, 1878.		
The People, etc., ex rel. Jo Hamilton, Attorney-General, Plaintiff, vs. the Neptune and Mermaid Sea Bathing Company, Defendant.	— District Court, City and County of San Francisco.	Civil.	Complaint—An action to try the rights of defendants to exercise the powers of a corporation.	Petition filed and leave granted to commence suit in the name of the People, Jan. 25, 1879.		
The People, etc., ex rel. J. A. Worthington, Plaintiff, vs. S. A. Smith, Respondent.	Thirteenth District Court, County of Merced.	Civil.	Complaint—An action to try the right of defendant to hold the office of Justice of the Peace.	Petition filed and leave to commence suit in the name of the People granted May 15, 1879.		
The People, etc., ex rel. John H. Pughman, Plaintiff, vs. A. C. Mullen, Defendant.	Fifth District Court, County of San Joaquin.	Civil.	Complaint—An action to inquire into the sufficiency of a supplemental bond, filed by defendant as Justice of the Peace.	Petition filed and leave granted to commence suit in the name of the People, June 19, 1879.		

The People, etc., ex rel. R. S. Holand, Plaintiff, vs. Board of Supervisors, San Mateo County, Defendant.	— District Court, County of San Mateo.	Civil.	Complaint—An action to require defendants to open a certain road in San Mateo County.	Petition filed and leave granted to commence suit in the name of the People, June 21, 1879.	
10,431—The People, etc., Respondent, vs. Hiram José Soriano, Appellant.	Municipal Criminal Court, City and County of San Francisco.	Civil.	Indictment—Grand larceny.	Dec. 4, 1878—Indictment found. Jan. 9, 1879—Plead not guilty. Feb. 4, 1879—Tried and convicted. May 24, 1879—Sentenced to one year in State Prison.	July 5, 1879—Transcript filed. Sept. 28, 1879—Judgment affirmed.
The People, etc., Plaintiff, vs. Hann. C. Harrison, N. Greene Curtis, et al., Defendants.	Sixth District Court, County of Sacramento.	Civil.	Complaint—An action to recover certain moneys collected by defendant Harrison as County Clerk of Sacramento County, due the State as delinquent taxes.	—, 1879—Complaint filed. —, 1879—Answer filed. —, 1879—Demurrer to answer filed. —, 1879—Argued and taken under advisement by the Court. —, 1879—Demurrer to answer sustained.	
The People, etc., Plaintiff, vs. A. Pfeiffer et al., Defendants.	Third District Court, County of Alameda.	Civil.	Complaint—An action to condemn certain lands for the purposes of the State University.	—, 1879—Complaint filed. —, 1879—Answer filed.	
10,432—The People, etc., Respondent, vs. John Baster, Appellant.	County Court, San Luis Obispo County.	Criminal.	Indictment—Assault with intent to commit murder.	June 3, 1879—Indictment found. June 10, 1879—Plead not guilty. July 8, 1879—Tried and convicted of an assault with a deadly weapon. July 9, 1879—Sentenced to one and one-half years in State Prison.	July 5, 1879—Transcript filed. July 21, 1879—Argued and submitted.

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution, and nature of demand or crime, adjudged.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,434—The People, etc., Respondent, vs. H. H. Miles, Appellant.	Thirteenth District Court, County of Tulare.	Criminal.	Indictment—Murder.	Dec. 4, 1878—Indictment found. Jan. 22, 1879—Plead not guilty. Feb. 11, 1879—Tried and convicted of manslaughter. March 3, 1879—Sentenced to seven years in State Prison.	July 19, 1879—Transcript filed. Nov. 11, 1879—Argued and submitted.	
10,435—The People, etc., Respondent, vs. Frank Cooper, Appellant.	County Court, County of Santa Cruz.	Criminal.	Indictment—Making false returns as an officer of a corporation.	Nov. 7, 1878—Indictment found. Jan. 27, 1879—Demurrer filed. March 7, 1879—Demurrer overruled. March 7, 1879—Plead not guilty. May 29, 1879—Tried and found guilty. June 4, 1879—Sentenced to two years in State Prison.	July 24, 1879—Transcript filed. Sept. 15, 1879—Argued and submitted. Oct. 25, 1879—Judgment reversed.	
10,436—The People, etc., Respondent, vs. Wong Ah Ngow, Appellant.	Fourth District Court, City and County of San Francisco.	Criminal.	Indictment—Murder.	April 20, 1877—Indictment found. May 13, 1878—Plead not guilty. Oct. 4, 1878—Tried and convicted of murder in first degree. March 22, 1879—Sentence of death imposed.	Aug. 26, 1879—Transcript filed.	
10,437—The People, etc., Respondent, vs. Michael Donnelly, Appellant.	County Court, County of Contra Costa.	Criminal.	Indictment—Mayhem.	March 6, 1879—Indictment found. March 6, 1879—Plead not guilty. March —, 1879—Tried and convicted. Aug. 14, 1879—Sentenced to one year and ten months in State Prison.	Aug. 30, 1879—Transcript filed. Sept. 17, 1879—Argued and submitted. Oct. 22, 1879—Judgment affirmed.	

10,438—The People, etc., Respondent, vs. Antoine Morine, Appellant.	Tenth District Court, County of Colusa.	Criminal.	Indictment—Murder.	July 19, 1877—Indictment found. Jan. 15, 1879—Tried a second time and convicted of murder in the first degree. Jan. 18, 1879—Sentenced to the State Prison for life.	Sept. 1, 1879—Transcript filed. Nov. 11 and 12, 1879—Argued and submitted.	
6,704—The People, etc., vs. The Board of Water Commissioners of the City and County of San Francisco.	Supreme Court.	Civil.	Petition for writ of mandate. An action to compel defendant to proceed to secure certain water privileges.	Petition filed, and leave granted to commence proceedings, July 16, 1879.	July 21, 1879—Petition filed. Sept. 22, 1879—Argued and submitted.	
W. R. Bowers vs. W. B. C. Brown, Controller.	Sixth District Court, County of Sacramento.	Civil.	Petition for writ of mandate. An action to compel defendant to draw certain warrants.	Sept. 10, 1879—Petition filed in District Court. Sept. 11, 1879—Answer filed. Sept. 12, 1879—Argued and petition refused.		
10,442—The People, etc., Respondent, vs. A. Lockman, Appellant.	County Court, County of San Joaquin.	Criminal.	Indictment—Burglary.	April 30, 1879—Indictment found. May 19, 1879—Demurrer filed. May 19, 1879—Demurrer overruled. May 19, 1879—Plead not guilty. June 4, 1879—Tried and convicted of burglary in first degree. June 23, 1879—Sentenced to five years in State Prison.	Oct. 15, 1879—Transcript filed. Nov. —, 1879—Submitted on briefs.	
10,443—The People, etc., Respondent, vs. J. A. Dowd, Appellant.	County Court, County of Santa Clara.	Criminal.	Indictment—Forgery.	May 22, 1879—Indictment found. May 25, 1879—Plead not guilty. Aug. 25, 1879—Tried and convicted. Aug. 27, 1879—Sentenced to one year in State Prison.	Oct. 15, 1879—Transcript filed. Nov. 14, 1879—Argued and submitted.	

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
10,444—The People, etc., Respondent, vs. Chas. Colly, Appellant.	Twentieth District Court, County of Santa Cruz.	Criminal.	Indictment—Murder.	Jan. 7, 1879—Indictment found. Feb. 11, 1879—Plead not guilty. June 17, 1879—Tried and convicted of murder in first degree. June 20, 1879—Sentence of death passed.	Oct. 18, 1879—Transcript filed. Nov. 15, 1879—Argued and submitted. Nov., 1879—Judgment affirmed.	
10,445—The People, etc., Respondent, vs. Elijah Dillabough, Appellant.	County Court, County of Tehama.	Criminal.	Indictment—Grand larceny.	June 13, 1879—Indictment found. June 18, 1879—Plead not guilty. June 25, 1879—Tried and convicted. June 27, 1879—Sentenced to five years in State Prison.	Oct. 31, 1879—Transcript filed. Nov. 14, 1879—Argued and judgment affirmed. Remittitur ordered forthwith.	
10,449—The People, etc., Respondent, vs. Samuel A. Saffel, Appellant.	Fifth District Court, County of Tehama.	Criminal.	Indictment—Murder.	Dec. 2, 1879—Indictment found. Jan. 8, 1879—Plead not guilty. July 9, 1879—Tried and convicted of manslaughter. July 16, 1879—Sentenced to eight years in State Prison.	Nov. 6, 1879—Transcript filed. Nov. 15, 1879—Argued and submitted.	
10,451—The People, etc., Respondent, vs. Amelia H. and W. H. Smallman, Appellants.	Municipal Criminal Court, City and County of San Francisco.	Criminal.	Indictment—Grand larceny.	April 7, 1879—Indictment found. April 15, 1879—Plead not guilty. May 20, 1879—Tried and convicted. June 21, 1879—Each defendant sentenced to four years in State Prison.	Nov. 10, 1879—Transcript filed.	

10,448—The People, etc., Respondent, vs. John J. Carrillo, Appellant.	County Court, County of Los Angeles.	Criminal.	Indictment—Embezzlement as a public officer.	March 11, 1879—Indictment found. March 17, 1879—Demurrer filed. March 17, 1879—Demurrer overruled. March 17, 1879—Plead not guilty. Oct. 7, 1879—Tried and convicted. Oct. 27, 1879—Sentenced to six years in State Prison.	Nov. 6, 1879—Transcript filed. Nov. —, 1879—Argued and submitted.
10,452—The People, etc., Respondent, vs. Henry A. Caulfield, Appellant.	Sixth District Court, County of Sacramento.	Criminal.	Indictment—Murder.	Oct. 29, 1878—Indictment found. —, 1878—Plead not guilty. —, 1879—Tried and convicted of manslaughter. April 25, 1879—Sentenced to six years in State Prison.	Nov. 11, 1879—Transcript filed. Nov. —, 1879—Argued and judgment affirmed.
The People, etc., ex rel. Pedro Vinet, Plaintiff, vs. —, Defendant.	Fifth District Court, County of San Joaquin.	Civil.	Complaint—An action brought to set aside a judgment annulling a certificate of purchase to a certain tract of school land.	Oct. 17, 1879—Petition filed for leave to commence proceedings in the name of the People of the State, and leave granted.	
The People, etc., ex rel. Jo Hamilton, Attorney-General, Plaintiff, vs. Patrick Moyle and John Moyle, Defendants.	Fourth District Court, City and County of San Francisco.	Civil.	Complaint—An action to have a certain street in the City and County of San Francisco opened.	Oct. 28, 1879—Petition filed for leave to commence proceedings in the name of the People of the State, and leave granted.	
The People, etc., ex rel. Jo Hamilton, Attorney-General, Plaintiff, vs. Colin M. Boyd, Defendant.	Twenty-third District Court, City and County of San Francisco.	Civil.	Complaint—An action to test the right to the office of Auditor of the City and County of San Francisco.	Oct. —, 1879—Petition filed for leave to commence proceedings in the name of the People of the State, and leave granted.	

COPY OF ATTORNEY-GENERAL'S DOCKET—Continued.

TITLE OF CAUSE.	In what county, district, and Court instituted, tried, and adjudged.	Character of cause—civil or criminal.	Mode of prosecution, and nature of demand or crime.	Stage of proceedings in Court below.	Memorandum of judgment in Supreme Court.	Memorandum of process issued.
The People, etc., ex rel. George B. Chester, Plaintiff, vs. W. S. Adams, Defendant.		Civil.	Complaint—An action to cancel a State patent.	Nov. 10, 1879—Petition filed for leave to commence proceedings in the name of the People of the State, and leave granted.		
The People, etc., ex rel. D. Murphy, Plaintiff, vs. M. J. O'Conner, Defendant.	— District Court, County of Los Angeles.	Civil.	Complaint—An action to cancel a State patent.	Nov. 26, 1879—Petition filed for leave to commence proceedings in the name of the People of the State, and leave granted.		
10453—The People, etc., Respondent, vs. N. B. Gillis, Appellant.	First District Court, County of San Luis Obispo.	Criminal.	Indictment—Murder.	Aug. 19, 1879—Indictment found. Sept. 17, 1879—Plead not guilty. Sept. 26, 1879—Tried and convicted of manslaughter. Oct. 1, 1879—Sentenced to five years in State Prison.	Nov. 14, 1879—Transcript filed. Nov. 15, 1879—Argued and judgment affirmed.	Remittitur ordered forthwith.

BIENNIAL REPORT

OF THE

ADJUTANT-GENERAL

OF THE

STATE OF CALIFORNIA.

1877-79.

REPORT.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA,)
ADJUTANT-GENERAL'S OFFICE,)
SACRAMENTO, August 1st, 1879.)

To His Excellency, William Irwin, Governor and Commander-in-Chief:

SIR: I have the honor to submit the following Report for the two years ending July 31st, 1879, in accordance with the provisions of Section 2108, Political Code.

FINANCIAL STATEMENT.

The expenditures out of the several appropriations for military purposes, including the amounts audited and allowed by the Board of Military Auditors, will be found in detail under head of Table A of this report.

All claims against the appropriation for deficiencies in armory rent and other expenses of the National Guard, as per Act, approved March 30th, 1876, are now paid, and an unexpended balance of \$3,314 62 remains.

The appropriation for payment of guard and other military duty, as per Act, approved March 29th, 1878, of \$5,202, has been paid in full.

Out of the appropriation of \$20,000 for the conservation of the public peace, approved March 30th, 1878, \$1,421 has been allowed and paid, leaving a balance of \$18,579.

An unexpended balance of \$368 80 remains, after paying all demands against the appropriation for cleaning and transportation of arms for the 28th and 29th fiscal years of \$1,500.

A balance of \$35 65 remains of the appropriation for armory rents and other expenses of the National Guard for the 28th and 29th fiscal years.

The expenditures for the 30th fiscal year, out of the appropriation for the 30th and 31st fiscal years, will be found in table above mentioned.

I have received from the city authorities of San Francisco (for equipments drawn from the United States on account of the State's quota, and loaned to and retained by said authorities) the sum of \$432. This amount you instructed me to expend in the purchase of arms from the United States Ordnance Department. I have made application to the department to buy Springfield rifles, cal. 45, they being the arms we are most in need of, and expect a favorable answer in a short time.

ACCOUNT OF ARMS AND MILITARY PROPERTY, AND CONDITION OF SAME.

Under head of Table B will be found a detailed account of the military property of the State.

It consists of 6 10-lb. Parrott guns, 2 6-lb. Napoleon guns, and 2 12-lb. howitzers, with carriages, caissons, battery wagons, and necessary appendages.

Of breech-loading arms there are 4 Gatling guns, cal. 45, complete; 1,877 Springfield rifles, cal. 45, with necessary spare parts; 50 Springfield rifles, cal. 50; 200 Springfield carbines, cal. 45; 98 Smith and Wesson revolvers, cal. 44; 60 Colt's pistols.

Of muzzle-loading arms there are 497 Springfield rifles, cal. 58; 242 Springfield muskets, cal. 69; 248 Whitney rifles, cal. 54; 80 Harper's Ferry muskets, cal. 54; 20 flint-lock muskets, cal. 69; 25 musketoons.

The amount of ammunition, number of equipments, uniforms, etc., will be found in table above referred to.

The property shown in table as in possession of the National Guard is what is charged against companies, etc., on the books of this office. Some companies report a less number of articles than the charge against them, but fail to explain for the deficiency as instructed, and consequently receive no credit for expenditures; others report more than has been issued them; the excess is charged against them, it being presumable that it is property purchased out of moneys received from the State, which is declared by the provisions of Section 2100, Political Code, to be the "property of the State." This class of property is shown on ordnance statement, in column under head of "Taken up since last report," and with the exception of the 50 stand of Springfield rifles, cal. 50, in possession of the Hewston Guard, unattached, Second, Brigade, N. G. C., consists principally of accouterments and uniforms; other property appearing in the said column was found since last report.

With the exception of two guns of the Sacramento Battery the condition of the artillery is good.

The breech-loading arms being comparatively new are in good condition. Some few, however, have been damaged, principally by the use of defective cartridges in rifle practice.

The expenditure of extra pieces has been large, owing to constant use.

The muzzle-loading arms are in medium condition, with the exception, perhaps, of 150 which are worthless.

Most of the property in the State Armory is old; the uniforms are of little, if any, value.

Under head of Table C is an account of the amount of property received and issued since last report.

ORDNANCE ACCOUNT WITH UNITED STATES.

The amount of the State's indebtedness to the General Government for ordnance, etc., issued to it in excess of its quota at the date of my last report, was \$32,959 98.

Through the kindness of Brigadier-General S. V. Benét, Chief of Ordnance, U. S. A., the State was enabled to clear off the above indebtedness by turning in as much of the property yet due as could be found, without regard to condition, receiving credit for it at original prices.

On October 10th, 1877, orders were issued to the different commands to collect all the old property in their possession for the purpose of returning the same to the United States in liquidation of the State's indebtedness. After an inspection of the old property in the several armories, by Lieutenant-Colonel J. McAllister, Commanding Benicia Arsenal, a number of the companies were instructed to forward the property they collected direct to Benicia Arsenal. The others returned theirs to the State Armory, and it, after an inspection by the officer above mentioned, was forwarded to the same destination.

Receipts for the property returned were given by Lieutenant-Colonel J. McAllister, Commanding Benicia Arsenal, and are now on file in this office, a list of which also appears in the ordnance statement in Table B of this report.

Under date of August 7th, 1878, a communication was received by your Excellency from the United States Ordnance Department, Washington, D. C., stating that the stores returned by the State and receipted for by the commanding officer of Benicia Arsenal, had been credited thereto, leaving the sum of \$10,615 10 subject to the requisition of the State from that date.

Property to the amount of \$10,606 was subsequently drawn by the State, leaving a balance due of \$9 10.

From the quota of the State, due June 30th, 1879, 85 Springfield rifles, cal. 45 have been drawn, 45 of which have been forwarded to the Los Angeles Guard, and 40 to the Chico Guard, leaving a balance due the State, as per communication from the United States Ordnance Department, dated July 30th, 1879, of \$1,612 81. The Commanding Officer of Benicia Arsenal has been requested to forward Springfield rifles, cal. 45, sufficient to correspond in value to the amount still due, and when the same are received they will be distributed among the companies not yet armed with breech-loaders.

By the liquidation of the indebtedness referred to, the State will be hereafter enabled to draw annually from the United States in ordnance, ordnance stores, etc., to the amount of \$2,878 71, the same being the present apportionment under the law of Congress for arming and equipping the militia.

To Brigadier-General S. V. Benét, Chief of Ordnance, U. S. A., as well as to Lieutenant-Colonel Julian McAllister, Commanding Benicia Arsenal, and Captain W. H. Rexford, Ordnance Store-keeper, Benicia Arsenal, I desire to express my sincere acknowledgments for considerations and accommodations extended through this office to the National Guard of California. I am also indebted to General John McComb, Commanding Second Brigade, N. G. C., for very efficient aid in the settlement of the State indebtedness.

NUMBER AND CONDITION OF THE NATIONAL GUARD.

The total strength of the National Guard of California, computed from the muster rolls of 1878, is 2,664 officers and enlisted men, a detailed statement of which will be found in Table D of this report.

Since my last report, Major-General E. J. Lewis has been appointed to the command of the National Guard of California, vice George R. Vernon, resigned. The report of the former will be found in the appendix to this report, to which, as well as to the reports of General John McComb, commanding Second Brigade, and General Thomas J. Clunie, commanding Fourth Brigade, which are also appended, I

would respectfully direct attention, in addition to the following remarks on the subject, for information on the condition, drill, and discipline, and general interests of the National Guard.

FIRST BRIGADE.

General E. M. Sanford tendered his resignation of the command of the First Brigade on April 8th, 1878, and the same having been accepted, P. W. Murphy, of San Luis Obispo, was appointed to fill the vacancy.

The Los Angeles Guard, as at last report, is yet the only company of this command. It is uniformed according to regulations, and has lately received Springfield breech-loaders, cal. 45. In accordance with your instructions, I recently visited and inspected this company. I found it in a better condition than I expected, but not as advanced as a company located in as favorable a locality as Los Angeles should be. The want of improved arms seemed to be one of the chief complaints—that want having been removed, and some other reforms suggested, I look for better results in the future.

SECOND BRIGADE.

This brigade is still under the efficient command of Brigadier-General John McComb. As will be seen by reference to Special Orders No. 3, C. S., 1878, appended to this report, Companies B and E, Second Infantry Regiment were, on the recommendation of the Colonel commanding the regiment, with the approval of the Brigade Commander, ordered to be consolidated into one company.

The formation of the said consolidated company having been effected, the name designated was "Company B," Second Infantry Regiment. The commissioned officers thereof were elected March 29th, 1878.

A vacancy having thus been created in the Second Infantry Regiment, and an application being on file from 67 citizens and residents of San Francisco for the formation of a company of infantry of the National Guard of California, the Brigadier-General Commanding Second Brigade, N. G. C., was, by the provisions of Special Orders No. 4 from these Headquarters, dated March 18th, 1878, directed to muster in the said company, and to attach the same to the Second Infantry Regiment, under the name and title of "Company F," Second Infantry Regiment.

The four Gatling guns in possession of the Union Guard, Company A, Second Infantry Regiment, having been permanently assigned thereto, the said company was detached from the Second Infantry Regiment, as per Special Orders No. 6, dated April 8th, 1878, to be thereafter known as "Union Guard, Company A, Gatling Battery." Colonel W. R. Smedberg, commanding the said regiment, was, by the provisions of the same order, authorized to organize a company of infantry to fill the vacancy thus created in his command. Such company was organized and officers elected July 1st, 1878. The name adopted was "Company G," Second Infantry Regiment.

The application of 47 citizens and residents of Oakland, Alameda County, to organize a company of cavalry, having been approved by the Board of Military Location and Organization, the company was ordered to be mustered into the State service per Special Orders No.

17, dated August 27th, 1878. The name designated was the "Oakland Light Cavalry, unattached."

The cavalry companies of this brigade are armed with Springfield carbines, cal. 45 (breech-loaders).

The infantry, with the exception of the Hewston Guard armed with Springfield rifles, cal. 50 (breech-loaders), and San José Zouaves, unattached (armed with muzzle-loaders, but which I hope to change for breech loaders before the close of the year), are armed with Springfield rifles, cal. 45 (breech-loaders).

The First California Guard, unattached, in addition to its field pieces, is armed with Smith and Wesson revolvers, cal. 44.

The command is well uniformed, though 2 companies have not as yet procured the regulation pattern.

On the 22d of February, 1879, your Excellency reviewed this brigade. Six of the general officers of the National Guard of California, with a number of their respective staffs, accompanied your Excellency on that occasion. From your expressions of approval I infer that you were pleased with the progress in numbers and condition made by the command since the occasion of a similar review in July, 1876.

THIRD BRIGADE.

This brigade is under the command of Brigadier-General Edward Canavan, and consists of one unattached company of infantry, the Stockton Guard, which is uniformed according to regulation, and has procured in addition, since my last report, a very attractive company uniform. It is armed with Springfield rifles, cal. 45 (breech-loaders).

FOURTH BRIGADE.

General M. S. Horan tendered his resignation as commander of this brigade November 4th, 1878, and the same having been accepted December 30th, 1878, Major T. J. Clunie, who was then in command of the First Battalion of Infantry, was appointed to fill the vacancy.

This brigade consists of 5 companies of infantry, which comprise the First Battalion of Infantry, and 1 unattached company of artillery.

The First Battalion of Infantry, under the command of Lieutenant-Colonel Creed Haymond, is rapidly improving both in drill and discipline.

The Sacramento Light Artillery, unattached, is not in as good condition as it should be. Its late Captain having been absent without leave, orders were issued declaring the office of Captain vacant. The Brigadier-General has ordered an election, and after a selection is made the company will, I trust, advance to a better standard.

The infantry companies are armed with Springfield rifles, cal. 45 (breech-loaders). The brigade is uniformed according to regulation.

FIFTH BRIGADE.

This brigade is under the command of Brigadier-General Charles Cadwalader, and at present consists of 1 unattached company of infantry, the Chico Guard. It has been lately armed with Springfield rifles, cal. 45 (breech-loaders), and is uniformed according to regulation. Since my last report the Siskiyou Guard, unattached, of this

command, was mustered out of the State service, in compliance with the request of the company.

SIXTH BRIGADE.

This brigade is commanded by Brigadier-General J. G. Wall, and consists of 1 unattached company of infantry, the Eureka Guard, which was mustered in March 15th, 1879. The company is not yet fully uniformed. It is at present armed with Springfield rifles, cal. 58 (muzzle-loaders), which I expect soon to replace with breech-loaders, and thus complete the armament of the infantry and cavalry, National Guard of California, with the most improved government arms.

In addition to the foregoing summary, I would add that the Legislature of the twenty-first session, which met since the date of my last report, made many effectual changes in the law for the government of the State Militia, which have had a salutary effect towards improving the condition and increasing the effectiveness and discipline of the State troops. It increased the maximum number of companies to 40. In addition to the privileges and exemptions to members of the National Guard, it restored that of exemption from jury duty and from service on any posse comitatus. It made provisions for the examination of elected officers of the National Guard of California as to their military and general qualifications; and also for the better government of companies, it provided for certain civil officers therefor, prescribing their duties, etc. It increased the monthly allowance to companies of cavalry and infantry from \$50 to \$75 per month, and of artillery from \$25 to \$37 50 per gun. It also made provision for a Gatling Battery, to be attached to a company of infantry, with an additional allowance of \$25 per month for each gun.

The monthly allowances to brigade, regimental, and battalion headquarters was increased from \$3 to \$4 50 per company.

The annual allowance of \$150 to companies was not changed.

Section 2029 of the Political Code provides as follows: "Commanders of companies must keep a book, in which must be entered the names and number of officers, non-commissioned officers, and privates, respectively, present at each drill, and must therefrom make monthly returns to the commanding officer of the regiment or battalion, and if unattached to the brigade commander, with excuses of absentees recorded, and marked approved or otherwise. These books must be carefully preserved, and when filled, forwarded to the Adjutant-General's office."

The books and monthly returns referred to in the section above quoted were furnished from these Headquarters, together with copies of General Orders No. 6, dated July 1st, 1878, giving instructions as to the manner in which they should be filled. Monthly returns were, by the provisions of the said General Orders No. 6, directed to be forwarded to General Headquarters. The compliance therewith has been almost general, and much benefit has resulted in the more thorough organization of the military force of the State.

Great difficulty having been found in obtaining the record of service of members of the National Guard, I have prepared a register containing the names of non-commissioned officers, musicians, and

privates (the record of commissioned officers being kept in roster), showing occupation, residence, date of enlistment, reenlistment, etc. All discharges and other changes are recorded thereon from the monthly returns. By this method the total strength of the National Guard of California can readily be obtained at any time, as well as the record of each man's service.

DRILL AND DISCIPLINE.

The companies located in the City and County of San Francisco, Sacramento, Oakland, Vallejo, San José, and Los Angeles are required by law to assemble once a week for drill. In other localities, once a month. As a rule the assemblages for drill are much more numerous than is required by law.

The several regiments and battalions hold regular battalion drills, which are generally well attended, and are producing good results. With some few exceptions the returns show the attendance at drills largely increased. From the zeal manifested by a majority of the commanding officers to thoroughly organize and perfect their commands—creditably seconded by the willingness and earnestness of subordinate officers and enlisted men—as well as from causes referred to under head of "Condition of National Guard of California," I regard the drill and discipline of the State troops much improved since my last report.

THE ENROLLED MILITIA.

The enrolled militia of the State, per returns for 1878, numbers 111,848. The numbers as reported by County Assessors, through the respective brigade commanders, for the years 1877 and 1878, will be found in Table E of this report.

TARGET PRACTICE.

The last Legislature made provisions for the appointment of a General Inspector of Rifle Practice, with the rank of Colonel on the staff of the Governor and Commander-in-Chief, and also for Inspectors of Rifle Practice on the staffs of the respective brigade, regimental, and battalion commanders, and passed an Act, approved March 12th, 1878, defining their duties, etc.

Much commendable interest continues to be manifested by the National Guard of California to increase its proficiency in the practical use of arms.

Reports of target practice of the different commands will be found in Table F, of this report, showing style of arms used, number of men firing, number of points possible to be made, number of points made, and company percentage.

In the reports of 1878 those of the First Infantry Regiment, excepting National Guard, Company "C," do not appear, as the General Inspector of Rifle Practice did not approve the same for the reason, as stated by him, that the distance fired was not as required by law.

INTER-STATE MILITARY MATCH.

At the date of my last report, as mentioned therein, preparations were then being made to send a team of National Guardsmen from this State to compete in the Inter-State Military Match of 1877, at Creedmoor, New York. After a series of competitive contests a team, consisting of the following named officers and members of the National Guard of this State, was selected, and a certificate furnished testifying that they, at that time (August 29th, 1877), were, and had been on June 1st, 1877, members of the National Guard of California:

Brigadier-General John McComb, Second Brigade, N. G. C.;

Captain H. J. Burns, Company "E," First Infantry Regiment, Second Brigade, N. G. C.;

Captain Wm. H. Brockhoff, Company, "D," Second Infantry Regiment, Second Brigade, N. G. C.;

Second Lieutenant J. Robertson, Company "E," First Infantry Regiment, Second Brigade, N. G. C.;

Sergeant C. P. Le Breton, Company "C," First Infantry Regiment, Second Brigade, N. G. C.;

Sergeant Harry Hook, Company "A," Second Infantry Regiment, Second Brigade, N. G. C.;

Sergeant J. P. Warren, Company "A," Second Infantry Regiment, Second Brigade, N. G. C.;

Corporal Chas. Nash, Company "C," First Infantry Regiment, Second Brigade, N. G. C.;

J. W. Maher, Company "C," First Infantry Regiment, Second Brigade, N. G. C.;

L. Barrere, Company "E," First Infantry Regiment, Second Brigade, N. G. C.;

E. H. Ladd, Company "A," Second Infantry Regiment, Second Brigade, N. G. C.;

Wm. Wright, Company "A," Second Infantry Regiment, Second Brigade, N. G. C.;

E. Unger, Company "B," First Infantry Regiment, Second Brigade, N. G. C.;

E. N. Snook, Company "C," First Infantry Regiment, Second Brigade, N. G. C.;

T. E. Carson, Company "E," First Infantry Regiment, Second Brigade, N. G. C.;

George H. Strong, Company "E," First Infantry Regiment, Second Brigade, N. G. C.

Of the above, the first twelve participated in the contest. The other States contesting were Connecticut, New York, and New Jersey.

The following is the score made by each State respectively.

	At 200 Yards.	At 500 Yards.	Total.
California-----	499	496	995
Connecticut-----	505	466	971
New York-----	480	487	967
New Jersey-----	411	333	744

From the above it will be seen that the total number of points made by the California team, in a possible 1,200 at 200 and 500 yards,

was 995, or $82\frac{1}{2}$ per cent., winning the prize ("The Soldier of Marathon") by 24 points in excess of Connecticut, 28 of New York, and 251 of New Jersey.

The members of the team, on their return to California, were the recipients of many evidences of the gratification of their fellow-citizens and fellow-soldiers at their brilliant achievement.

The individual scores of the members, as well as fuller details of the contest, will be found in the report of General John McComb, Captain of the Team, in the appendix to this report.

ENCAMPMENTS.

Notwithstanding that there was no appropriation made for paying the expenses, nor any provision of law requiring the holding of encampments, nearly all of the commands of the National Guard of California, since the date of my last report, have gone into encampment ranging from two to four days.

Notably in this connection I would mention that the State Agricultural Society, in conjunction with the citizens of Sacramento, having offered inducements in the way of prizes for drill and marksmanship to companies attending the State Fair of 1878, and having been requested to take charge of the same, I communicated with the different commands, stating the number of prizes to be awarded, and the conditions.

The following decided to attend and hold an encampment of four days: First Infantry Regiment, together with the Oakland Guard, which was temporarily attached to the First Infantry; Emmet Guard, Company "E," Third Infantry; Jackson Dragoons, Company "C," First Cavalry Battalion (very kindly, at short notice, and without any intention of competing for any of the prizes) came to act as an escort to your Excellency; Placerville City Guard, Company "D," First Battalion of Infantry; and the City Guard, Company "A," and Sarsfield Guard, Company "G," of the same command.

The St. Patrick's Cadets, an excellent organization of youths from San Francisco, also participated.

Your Excellency visited the camp, named "Camp Irwin" in your honor, and reviewed the troops there, and subsequently at the Agricultural Fair Grounds, accompanied by a number of the general officers of the National Guard of California and their respective staffs.

Honorable D. M. Key, Postmaster-General, was present on the last occasion, and the military exercises were witnessed by an unusually large assemblage of people.

It being desirable that the competitive drill should be decided by judges of whose competency and impartiality there would be no question, I communicated with Major-General Irwin McDowell, Commanding Military Division of the Pacific, and Department of California, to obtain the services of two officers of his command to act as judges. He was pleased to reply that he would be happy to give them the necessary authority to be absent, so as to comply with my wishes.

I thereupon extended invitations to Captain Harry C. Cushing, Fourth United States Artillery and Brevet-Major U. S. A.; to Captain Edward Field, Fourth United States Artillery, and also to Lieutenant G. G. Greenough, First Lieutenant Fourth United States Artillery,

and Professor of Military Science and Tactics, University of California, to act as judges of competitive drill, which they very kindly accepted. I do not know that I can state the satisfaction that their services rendered in more expressive terms than to say that their decisions were accepted without any complaint by the companies competing. Personally I return them my most grateful thanks.

The following extract from the report of those officers will be read with pleasure by the friends of the National Guard:

The judges unite in the statement that they have rarely if ever observed a series of drills so uniform in excellence. The contesting companies displayed a very thorough knowledge of the tactics as embraced in the scheme of competition, and it was evident that careful and conscientious work had been expended on them by their several commanders.

The following were the companies that entered for the competitive drill:

City Guard, Company "B," First Infantry Regiment, Second Brigade, Captain J. H. Dickenson.

Franklin Light Infantry, Company "D," First Infantry Regiment, Second Brigade, Captain R. H. Orton.

Emmet Guard, Company "E," Third Infantry Regiment, Second Brigade, Captain Robert Cleary.

PRIZES FOR DRILLING.

First Prize.—Franklin Light Infantry, Company "D," First Infantry Regiment, Captain R. H. Orton, \$300 and gold medal, presented by the President of the State Agricultural Society, M. D. Boruck.

Second Prize.—City Guard, Company "B," First Infantry Regiment, Captain J. H. Dickenson, \$200.

The rifle contest was held under the supervision of Colonel James A. Laven, General Inspector of Rifle Practice, N. G. C., assisted by Major William I. Wallace, Inspector of Rifle Practice, on the staff of the Brigadier-General commanding Fourth Brigade N. G. C., to whom much credit is also due for the satisfactory manner in which they conducted the same.

The following companies entered for the competitive rifle shooting contest:

Sumner Light Guard, Company "E," First Infantry Regiment, Second Brigade, Captain H. J. Burns commanding.

Sarsfield Guard, Company "G," First Battalion of Infantry, Fourth Brigade, Captain C. A. Laufkotter commanding.

Oakland Guard, (unattached), Second Brigade, Captain H. D. Ranlett commanding.

PRIZES FOR RIFLE SHOOTING CONTEST.

First Prize.—Sumner Light Guard, Company "E," First Infantry Regiment, Captain H. J. Burns, \$300 and gold medal, presented by President of the State Agricultural Society, M. D. Boruck.

Second Prize.—Sarsfield Guard, Company "G," First Battalion of Infantry, Captain C. A. Laufkotter, \$200.

Incidentally I desire to mention that a prize of \$100 having been subscribed for the best drilled Cadet Company, and only one having attended—the St. Patrick's Cadets of San Francisco—the prize was

awarded to it after a very creditable exhibition drill. With a graceful generosity, highly creditable to the recipients, they resolved to donate it to the fund for the relief of the yellow fever sufferers in the South.

SERVICES OF THE NATIONAL GUARD.

Since my last report the companies located in San Francisco have been frequently called on to assemble in their respective armories, on account of apprehensions of disturbances of the public peace. A most commendable disposition has been always manifested by the several commands to do their duty. The call of the municipal authorities has always been responded to with promptness. I am pleased to say that notwithstanding the exciting political agitations through which we have passed for the last two years, no signal violation of the peace has occurred, and consequently no protracted duty has been required of the troops, other than a proper vigilance of the respective armories.

ARMS SENT TO MODOC COUNTY.

During the late Indian war in Oregon and neighboring States and Territories, the settlers in portions of Modoc County became alarmed, and in July of last year, at their request, arms and ammunition were sent them. No occasion for their use occurred, and as soon as the apprehensions of danger passed away, they were returned to the State Armory. Some of the ammunition had been expended, likely in trying the arms.

NEW CONSTITUTION.

With the exception of a section prescribing the flags to be used by State troops, the Article relative to the militia in the New Constitution is, in substance, the same as in the old Constitution.

MISCELLANEOUS.

The Roster of the National Guard of California will be found under head of Table G; the retired list of commissioned officers under Table H; list of exempt certificates under Table I; resignations and casualties under Table J; commissions issued to officers of battalion of University Cadets under Table K; pardons to members of National Guard of California dishonorably discharged, under Table L; General Orders issued since last report; together with important Special Orders, will be found in Appendix; and in addition to the reports of general officers heretofore mentioned, that of the Professor of Military Science and Tactics, University of California, and a subsequent letter thereto (written in reply to a communication from this office), to which I would respectfully call attention.

RECOMMENDATIONS.

Owing to the many beneficial changes made in the military law at the last session of the Legislature I have but a few recommendations to present.

I am of the opinion that it would be of benefit to the National Guard, and eventually an economy to the State, if suitable armories, or an

armory sufficiently large for all the commands located in San Francisco, was erected in that city. This matter has been long contemplated, and I believe the saving to the State in armory rents would soon compensate for the expenditure of building. No doubt it could be arranged that the city of San Francisco would furnish the necessary sites. In this connection, I would respectfully refer to the remarks of General McComb, in his report.

A proper magazine for the care of the State ammunition should be erected in Sacramento.

Most of the States that have an organized militia, in addition to their military laws have adopted and issued codes of regulations for the use and instruction of their military forces. I would respectfully recommend that a Board of Officers be authorized to prepare a code of regulations for the National Guard of California, to be submitted for revisal and approval to the Adjutant-General.

In addition to the amount necessary to pay armory rents, etc., of the National Guard, an amount should be added for the payment of officers detailed on special duty. The members of Examining Boards should receive compensation for their services. In San Francisco they should hold monthly meetings; in the other brigades whenever requisite, in the opinion of General Headquarters.

In the enrollment of the general appropriation bill for the 30th and 31st fiscal years, the amount of appropriation for armory rents and other expenses of the National Guard for said fiscal years was, by an error of the clerk who enrolled the bill, reduced \$9,000; owing to this circumstance, and a desire, if possible, not to create a deficiency, the expenses for the 30th fiscal year were endeavored to be kept, as near as possible, within half the amount (\$45,264) of the appropriation of \$90,528 instead of \$99,528. There has been allowed to date for 30th fiscal year, ending June 30th, 1879, \$45,144 25, leaving a balance of \$119 75, and there are claims amounting to \$740 on file, which leave a deficiency of \$620 25 for the 30th fiscal year, for which an appropriation should be made. It is not in my power at present to say what the deficiency for the 31st fiscal year will be.

An allowance of ammunition for target practice should be given each company on requisition approved by respective Inspectors of Rifle Practice.

I would recommend that the opportunities for being placed on the retired list (Section 1973, Political Code) be extended to officers who have served ten years in the National Guard, without regard to consecutive service, or being at the time of retirement in the service. Meritorious service might also be a proper reason for bestowing said honor, the same to be determined by the Commander-in-Chief.

Some dissatisfaction has been expressed at the excessive penalty provided by Section 2028, Political Code, for being absent from three consecutive assemblages without an excuse acceptable to the commanding officer.

This provision was intended to weed out useless members, and it undoubtedly has had that effect. If, in any instance, injustice had been done, and a reasonable excuse was not accepted by the commanding officer, an appeal could be made to the regimental or battalion commander, or to the Commander-in-Chief, or that being neglected, a further opportunity for redress is afforded by an application for pardon to the Commander-in-Chief.

In very few instances have any of these provisions been resorted

to. It might be well to attach a less odious penalty to the offense than *dishonorable* discharge. Discharged for non-attendance might be substituted, and members so discharged might be prevented from again joining the National Guard until pardoned by the Commander-in-Chief.

The pay for enlisted men of the National Guard of California, when called into active service—when such service is of short duration—should be more than is provided for in Section 2065, Political Code.

I would again urge my recommendation made in last report for an appropriation for annual or biennial encampments in the respective brigades.

CONCLUSION.

With the expression of the wish that the National Guard of California may continue to enjoy the generous fosterage of the State, and prove worthy of its liberal recognition—continuing to perfect its organization, its efficiency, and reliability, and thus be ever ready of fulfilling the objects for which it is designed—thanking your Excellency for continued considerations to myself, and appreciative and encouraging attentions to the interests of the National Guard, and expressing my acknowledgments for able and efficient aid rendered by officers having official business with me, I am,

Very respectfully, your obedient servant,

P. F. WALSH,
Adjutant-General.

TABLE A. APPROPRIATIONS AND EXPENDITURES.

Appropriation for deficiencies in armory rent and other expenses of the National Guard, 26th and 27th fiscal years, as per Act approved March 30th, 1876.

Balance unexpended, as per last report -----		\$5,538 62
January 22d, 1878—Allowed Los Angeles Guard, unattached -----	\$1,064 00	
February 18th, 1878—Allowed Nevada Light Guard, Company "C," -----		
First Battalion of Infantry -----	1,160 00	
Balance in fund, August 1st, 1879 -----	3,314 62	
	<hr/>	<hr/>
	\$5,538 62	\$5,538 62

Appropriation for the payment of guard and other military duty performed in San Francisco in November, 1877, and January, 1878, by detachments of the National Guard, and other expenses appertaining thereto, as per Act approved March 29th, 1878.

March 29th, 1878—Amount of appropriation -----		\$5,202 00
April 4th, 1878—Allowed headquarters Second Brigade, Brigadier-General John McComb commanding -----	\$148 00	
April 4th, 1878—Allowed First Infantry Regiment, Colonel O. Woodhams commanding -----	1,316 00	
April 4th, 1878—Allowed Second Infantry Regiment, Colonel W. R. Smedberg commanding -----	1,490 00	
April 4th, 1878—Allowed Third Infantry Regiment, Colonel A. Wason commanding -----	1,416 00	
April 4th, 1878—Allowed First California Guard, unattached, Captain R. G. Brush commanding -----	832 00	
	<hr/>	<hr/>
	\$5,202 00	\$5,202 00

Appropriation for the conservation of the public peace, as per Act approved March 30th, 1878.

March 30th, 1878—Amount of appropriation -----		\$20,000 00
June 27th, 1879—Allowed Union Guard, Company "A," Gatling Battery, Captain A. J. Fritz commanding -----	\$972 00	
June 27th, 1879—Allowed San Francisco Cadets, Company "H," Second Infantry Regiment, Captain George Bigley commanding -----	59 00	
June 27th, 1879—Allowed Emmet Guard, Company "E," Third Infantry Regiment, Captain Robert Cleary commanding -----	390 00	
Balance in fund -----	18,579 00	
	<hr/>	<hr/>
	\$20,000 00	\$20,000 00

APPROPRIATIONS AND EXPENDITURES—29TH FISCAL YEAR.

Salary of Adjutant-General.

July 1st, 1877—Amount of appropriation -----		\$3,000 00
Certified to P. F. Walsh -----	\$3,000 00	
	<hr/>	<hr/>
	\$3,000 00	\$3,000 00

Salary of Assistant Adjutant-General.

July 1st, 1877—Amount of appropriation -----		\$2,000 00
Certified to George E. Aiken -----	\$2,000 00	
	<hr/>	<hr/>
	\$2,000 00	\$2,000 00

Pay of Porter.

July 1st, 1877—Amount of appropriation -----		\$300 00
Certified to P. J. Harney -----	\$300 00	
	<hr/>	<hr/>
	\$300 00	\$300 00

Postage, Expressage.

July 1st, 1877—Amount of appropriation -----		\$100 00
October 3d, 1877—Certified to P. F. Walsh -----	\$25 00	
November 19th, 1877—Certified to Wells, Fargo & Co.'s Express -----	2 95	
December 22d, 1877—Certified to P. F. Walsh -----	25 00	
March 4th, 1878—Certified to P. F. Walsh -----	25 00	
May 27th, 1878—Certified to P. F. Walsh -----	22 05	
	<hr/>	<hr/>
	\$100 00	\$100 00

Cleaning and transportation of arms—29th fiscal year.

July 1st, 1877—Amount of appropriation, together with balance in fund from 28th fiscal year.....		\$1,166 95
November 19th, 1877—Certified to Wells, Fargo & Co.'s Express.....	\$11 80	
November 19th, 1877—Certified to P. J. Harney.....	40 00	
December 10th, 1877—Certified to P. F. Walsh.....	151 55	
December 22d, 1877—Certified to P. J. Harney.....	50 00	
January 28th, 1878—Certified to Central Pacific Railroad Co.....	17 35	
January 28th, 1878—Certified to Wells, Fargo & Co.'s Express.....	4 10	
March 4th, 1878—Certified to P. J. Harney.....	50 00	
March 4th, 1878—Certified to J. Morton & Co.....	12 00	
March 4th, 1878—Certified to M. C. Byrne.....	5 50	
April 20th, 1878—Certified to P. J. Harney.....	25 00	
April 20th, 1878—Certified to W. R. Smedberg.....	13 00	
April 20th, 1878—Certified to A. J. Plate & Co.....	5 20	
April 20th, 1878—Certified to Wells, Fargo & Co.'s Express.....	2 90	
April 20th, 1878—Certified to P. F. Walsh.....	96 70	
May 27th, 1878—Certified to Huntington, Hopkins & Co.....	20 30	
May 27th, 1878—Certified to P. J. Harney.....	25 00	
June 29th, 1878—Certified to John Wall.....	2 40	
June 29th, 1878—Certified to John Perry.....	4 60	
June 29th, 1878—Certified to P. J. Harney.....	50 00	
July 22d, 1878—Certified to P. F. Walsh.....	55 00	
July 22d, 1878—Certified to Wells, Fargo & Co.'s Express.....	9 95	
July 22d, 1878—Certified to Samuel N. Pitcher.....	5 00	
July 22d, 1878—Certified to John Perry.....	15 00	
July 22d, 1878—Certified to W. R. Smedberg.....	33 00	
August 19th, 1878—Certified to Wells, Fargo & Co.'s Express.....	75 30	
August 19th, 1878—Certified to M. C. Byrne.....	17 50	
Balance in fund.....	368 80	
	<hr/>	
	\$1,166 95	\$1,166 95

Amount allowed to National Guard of California for the balance of the 28th fiscal year, and allowances of the 29th fiscal year, out of the appropriation for the 28th and 29th fiscal years.

Amount of appropriation unexpended.....		\$30,727 50
To First Brigade Headquarters.....	\$63 00	
To Second Brigade Headquarters.....	936 00	
To Third Brigade Headquarters.....	36 00	
To Fourth Brigade Headquarters.....	252 00	
To Fifth Brigade Headquarters.....	72 00	
To First Infantry Regiment Headquarters.....	216 00	
To Second Infantry Regiment Headquarters.....	216 00	
To Third Infantry Regiment Headquarters.....	216 00	
To First Infantry Battalion Headquarters.....	180 00	
To First Cavalry Battalion Headquarters.....	108 00	
<i>First Cavalry Battalion.</i>		
To First Light Dragoons, Company "A".....	745 00	
To San Francisco Hussars, Company "B".....	750 00	
To Jackson Dragoons, Company "C".....	727 50	
<i>Artillery Companies.</i>		
To First California Guard.....	1,950 00	
To Sacramento Light Artillery.....	1,350 00	
<i>First Infantry Regiment.</i>		
To City Guard, Company "B".....	747 50	
To National Guard, Company "C".....	857 50	
To Franklin Light Infantry, Company "D".....	750 00	
To Sumner Light Guard, Company "E".....	735 00	
To Light Guard, Company "F".....	722 50	
To Hewston Rifles, Company "H".....	742 50	
<i>Second Infantry Regiment.</i>		
To Union Guard, Company "A".....	750 00	
To ———, Company "B".....	750 00	
To San Francisco Fusileers, Company "C".....	750 00	
To Germania Rifles, Company "D".....	750 00	
	<hr/>	
Amount carried forward.....	15,372 50	\$30,727 50

Amount brought forward.....	\$15,372 50	\$30,727 50
To Steuben Guard, Company "E".....	549 35	
To ———, Company "F".....	150 00	
To San Francisco Cadets, Company "H".....	750 00	

Third Infantry Regiment.

To Montgomery Guard, Company "A".....	750 00	
To Shields Guard, Company "B".....	750 00	
To Wolfe Tone Guard, Company "C".....	750 00	
To Meagher Guard, Company "D".....	750 00	
To Emmet Guard, Company "E".....	750 00	
To McMahon Guard, Company "H".....	732 50	

First Infantry Battalion.

To City Guard, Company "A".....	750 00	
To Nevada Light Guard, Company "C".....	900 00	
To Placerville City Guard, Company "D".....	750 00	
To Yuba Light Infantry, Company "E".....	750 00	
To Sarsfield Guard, Company "G".....	750 00	

Unattached Companies.

To Hewston Guard.....	900 00	
To Oakland Guard.....	750 00	
To Vallejo Rifles.....	750 00	
To San José Zouaves.....	857 50	
To Stockton Guard.....	750 00	
To Los Angeles Guard.....	750 00	
To Chico Guard.....	730 00	
Balance in fund.....	35 65	

	\$30,727 50	\$30,727 50
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APPROPRIATIONS AND EXPENDITURES—30TH FISCAL YEAR.

Salary of Adjutant-General.

July 1st, 1878—Amount of appropriation.....		\$3,000 00
Certified to P. F. Walsh.....	\$3,000 00	
	\$3,000 00	\$3,000 00

Salary of Assistant Adjutant-General.

July 1st, 1878—Amount of appropriation.....		\$2,000 00
Certified to Geo. E. Aiken.....	\$499 98	
Certified to P. J. Harney.....	1,500 02	
	\$2,000 00	\$2,000 00

Pay of Porter.

July 1st, 1878—Amount of appropriation.....		\$300 00
Certified to P. J. Harney.....	\$75 00	
Certified to Charles Dodge.....	225 00	
	\$300 00	\$300 00

Postage, Expressage.

July 1st, 1878—Amount of appropriation.....		\$100 00
October 5th, 1878—Certified to P. F. Walsh.....	\$23 25	
October 5th, 1878—Certified to Wells, Fargo & Co.'s Express.....	10 90	
December 31st, 1878—Certified to Wells, Fargo & Co.'s Express.....	1 70	
December 31st, 1878—Certified to P. F. Walsh.....	15 00	
December 31st, 1878—Certified to Western Union Telegraph Co.....	4 35	
March 31st, 1879—Certified to P. F. Walsh.....	13 42	
March 31st, 1879—Certified to Wells, Fargo & Co.'s Express.....	5 05	
July 24th, 1879—Certified to P. J. Harney.....	14 70	
July 24th, 1879—Certified to Wells, Fargo & Co.'s Express.....	4 75	
Balance in fund.....	6 88	
	\$100 00	\$100 00

*Cleaning and transportation of arms, traveling and contingent expenses of the Adjutant-General,
30th fiscal year.*

July 1st, 1878—Amount of appropriation		\$750 00
July 22d, 1878—Certified to P. F. Walsh	\$53 50	
July 22d, 1878—Certified to Geo. Buck	3 00	
August 19th, 1878—Certified to Central Pacific Railroad	18 37	
August 19th, 1878—Certified to P. J. Harney	25 00	
August 19th, 1878—Certified to John Perry	8 00	
September 20th, 1878—Certified to P. J. Harney	25 00	
October 5th, 1878—Certified to Wells, Fargo & Co.'s Express	41 15	
October 5th, 1878—Certified to C. H. Holton	3 75	
October 5th, 1878—Certified to Geo. I. Lytle	3 30	
October 5th, 1878—Certified to W. L. Pritchard & Co.	15 00	
October 5th, 1878—Certified to John Perry	6 00	
December 2d, 1878—Certified to John Perry	4 00	
December 31st, 1878—Certified to P. F. Walsh	87 00	
December 31st, 1878—Certified to John Perry	7 00	
December 31st, 1878—Certified to John Wall	12 40	
December 31st, 1878—Certified to C. E. Spencer	3 25	
December 31st, 1878—Certified to Geo. I. Lytle	3 30	
February 17th, 1879—Certified to John Perry	2 00	
February 17th, 1879—Certified to C. H. Holton	2 60	
March 29th, 1879—Certified to Central Pacific Railroad	15 37	
March 29th, 1879—Certified to Geo. I. Lytle	3 30	
March 29th, 1879—Certified to P. F. Walsh	5 00	
May 21st, 1879—Certified to Daniel Ream	23 80	
June 27th, 1879—Certified to C. H. Holton	3 25	
June 27th, 1879—Certified to Charles E. Spencer	6 00	
June 27th, 1879—Certified to John Perry	23 60	
July 24th, 1879—Certified to P. F. Walsh	204 00	
July 24th, 1879—Certified to John Perry	8 00	
July 24th, 1879—Certified to Charles Dodge	6 10	
July 24th, 1879—Certified to Pacific Ice Company	1 80	
July 24th, 1879—Certified to John Wall	12 60	
July 24th, 1879—Certified to G. I. Lytle	2 75	
July 24th, 1879—Certified to Wells, Fargo & Co.'s Express	6 65	
Balance in fund	104 16	
	<hr/>	
	\$750 00	\$750 00

Amount allowed to National Guard of California, 30th fiscal year, 1878-9.

Amount of appropriation		\$45,264 00
To Headquarters Major-General	\$300 00	
To First Brigade Headquarters	54 00	
To Second Brigade Headquarters	1,498 50	
To Third Brigade Headquarters	54 00	
To Fourth Brigade Headquarters	324 00	
To Fifth Brigade Headquarters	81 00	
To Sixth Brigade Headquarters	13 50	
To First Infantry Regiment Headquarters	324 00	
To Second Infantry Regiment Headquarters	324 00	
To Third Infantry Regiment Headquarters	324 00	
To First Infantry Battalion Headquarters	270 00	
To First Cavalry Battalion Headquarters	162 00	

First Cavalry Battalion.

To First Light Dragoons, Company "A"	1,050 00
To San Francisco Hussars, Company "B"	1,050 00
To Jackson Dragoons, Company "C"	1,012 50

Artillery Companies.

To First California Guard	2,700 00
To Sacramento Light Artillery	1,756 00

First Infantry Regiment.

To City Guard, Company "B"	1,042 50
To National Guard, Company "C"	1,050 00
To Franklin Light Infantry, Company "D"	1,050 00
To Sumner Light Guard, Company "E"	1,035 00
To Light Guard, Company "F"	1,050 00
To Hewston Rifles, Company "H"	1,050 00

Second Infantry Regiment.

To ———, Company "B"-----	1,037 50
To San Francisco Fusileers, Company "C"-----	1,050 00
To Germania Rifles, Company "D"-----	1,050 00
To ———, Company "F"-----	1,050 00
To ———, Company "G"-----	1,012 50
To San Francisco Cadets, Company "H"-----	1,050 00

Third Infantry Regiment.

To Montgomery Guard, Company "A"-----	1,050 00
To Shields Guard, Company "B"-----	1,050 00
To Wolfe Tone Guard, Company "C"-----	1,050 00
To Meagher Guard, Company "D"-----	1,050 00
To Emmet Guard, Company "E"-----	1,037 50
To McMahon Guard, Company "H"-----	1,050 00

First Infantry Battalion.

To City Guard, Company "A"-----	1,050 00
To Nevada Light Guard, Company "C"-----	900 00
To Placerville City Guard, Company "D"-----	886 35
To Yuba Light Infantry, Company "E"-----	900 00
To Sarsfield Guard, Company "G"-----	1,050 00

Unattached Companies, Etc.

Union Guard, Company "A," Gatling Battery-----	2,250 00	
Oakland Light Cavalry-----	787 50	
Hewston Guard-----	900 00	
Oakland Guard-----	1,050 00	
Vallejo Rifles-----	1,050 00	
San José Zouaves-----	900 00	
Los Angeles Guard-----	1,025 00	
Stockton Guard-----	1,050 00	
Chico Guard-----	1,020 00	
Eureka Guard-----	212 90	
Balance in fund-----	119 75	
	<hr/>	
	\$45,264 00	\$45,264 00

STATE OF CALIFORNIA, }
County of Sacramento, } ss.

P. F. Walsh, Adjutant-General, being duly sworn, says that the amounts certified to in the foregoing tables, under head of postage, expressage, and cleaning and transportation of arms, traveling, and contingent expenses of the Adjutant-General, were expended for the purposes above mentioned, to the best of his knowledge and belief.

P. F. WALSH.

[SEAL.] Subscribed and sworn to before me, this 1st day of August, A. D. 1879.

D. B. WOOLF, Clerk.
By JOHN P. POOLE, Deputy Clerk.

TABLE B. MILITARY PROPERTY OF THE STATE.

PROPERTY.	Total Military Property of the State at last Report	Received from United States since last Report	Taken up since last Report	Total to be Accounted for	In State Armory August 1st, 1879	In Possession of National Guard of California	In Possession of Colleges, Independent Companies, etc.	Returned to United States since last Report	Accounted for by Affidavit—Expended in Service or Lost	Total Military Property of the State of California August 1st, 1879
Parrot guns, 10-lb.	6	—	—	6	—	6	—	—	—	6
Guns, 6-lb.	2	—	—	2	—	2	—	—	—	2
Howitzers, 12-lb.	2	—	—	2	—	2	—	—	—	2
Caissons	10	—	—	10	—	10	—	—	—	10
Axes, felling	4	—	—	4	—	3	—	—	1	3
Sponge buckets	10	—	—	10	—	10	—	—	—	10
Tar buckets	16	—	—	16	—	16	—	—	—	16
Water buckets	12	—	14	26	—	26	—	—	—	26
Gunner's gimbets	8	—	1	9	—	9	—	—	—	9
Gunner's haversacks	16	—	—	16	—	19	—	1	—	19
Handspikes	26	—	4	26	—	26	—	—	—	26
Wheel harness	22	—	—	22	—	22	—	—	—	22
Lead harness	36	—	—	36	—	36	—	—	—	36
Lanyards	16	—	—	16	—	15	—	1	—	15
Lint stocks	4	—	—	4	—	—	—	—	4	4
Vent covers	10	—	—	10	—	10	—	—	—	10
Priming wire	16	—	—	16	—	7	—	9	—	7
Prolongs	10	—	—	10	—	10	—	—	—	10
Tarpanins	16	—	—	16	—	11	—	3	2	11
Tangent scales	10	—	—	10	—	4	—	—	1	4
Thumb stalls	3	—	17	20	—	16	—	4	—	16
Tow hooks	10	—	—	10	—	4	—	3	3	4
Horse brushes	—	—	1	1	—	—	—	—	—	—
Lariats	—	—	14	14	—	—	—	14	—	—

Bayonets, bronzed	1,490	385	1,875	5	1,867	1,872
Screw-drivers	1,396	500	1,896	356	1,514	1,870
Tumbler punches	282	100	406	82	324	406
Spring vises	60	25	85	11	72	83
Breech block cap screws	338	125	463	94	328	41
Cam latch springs	354	125	479	83	367	29
Ejector springs	355	125	480	82	379	19
Extractors	138	50	188	11	155	22
Firing pins	345	125	470	53	363	166
Firing pin screws	355	125	480	80	368	54
Firing pin springs	345	125	470	54	348	32
Main springs	352	125	484	103	381	68
Scar springs	353	125	478	79	376	484
Tumbler screws	355	125	480	81	355	23
Winding rods	20	20	20	8	12	44
Brushes and thongs	200	200	200	77	120	20
Carbine cartridge pouches *	200	200	200	10	88	98
Arm chests	75	31	106	10	88	98
Springfield r. muskets, cal. 58	775	5	780	56	217	497
Muskets, smooth bore, cal. 69	242	25	242	157	85	242
Musketoon	25	25	25	25	25	25
Muskets, flint lock, cal. 69	20	20	20	20	20	20
Bayonets	1,010	50	1,060	356	447	1,034
Muskets, Harper's Ferry, cal. 54	80	42	80	80	26	80
Bayonets, sword	248	42	248	218	30	42
Whitney rifles, cal. 54	2,826	575	3,401	42	1,398	248
Bayonet scabbards	38	123	38	38	96	1,536
Bayonet scabbards, sword	2,773	258	2,896	30	866	38
Cartridge boxes	2,773	258	2,773	30	836	990
Cartridge box plates	2,773	184	1,864	50	599	960
Cartridge box belts	1,606	42	1,790	15	734	721
Cartridge box belt plates	2,668	40	2,710	15	1,253	794
Waist belts	2,668	40	2,668	15	1,286	1,370
Waist belt plates	40	40	40	40	1,129	1,459
Waist belts, Harper's Ferry	40	40	40	40	40	40
Waist belt plates, Harper's Ferry	1,354	625	2,560	188	401	479
Cap boxes and picks	2,190	20	2,190	515	824	1,111
Gun slings	1,148	911	1,148	300	431	1,045
Screw-drivers	911	20	931	300	548	931
Wipers	1,766	20	1,766	539	753	1,419
Tunpions	1,766	20	1,766	539	753	1,419

* Sold to municipal authorities of San Francisco.

TABLE B—Continued.

PROPERTY.	Total Military Property of the State at last Report							Received from United States since last Report		Taken up since last Report		Total to be Accounted for		In State Armory August 1st, 1879		In Possession of National Guard of California		In Possession of Colleges, Independent Companies, etc.		Returned to United States since last Report		Accounted for by Affidavit—Expended in Service or Lost		Total Military Property of the State of California August 1st, 1879		
	975	143	1,118	618	441	65	1,124	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Extra cones	278	---	278	137	116	---	253	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Tumbler punches	170	---	170	17	65	4	146	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ball screws	95	---	95	---	---	---	58	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Spring vises	23	---	23	---	---	---	20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sawdges	43	14	57	14	39	4	57	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sergeants' swords	43	13	56	13	39	4	56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sergeants' sword scabbards	19	3	22	---	22	---	22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sergeants' sword belts	19	1	20	---	20	---	20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sergeants' sword belt plates	274	15	289	188	97	4	289	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Extra main springs	282	34	316	235	81	---	316	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Extra sear springs	189	66	255	183	68	4	255	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Extra tumbler screws	4	6	10	5	4	1	10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Bullet moulds	57	9	66	23	33	10	66	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ann chests	363	14	377	42	130	---	172	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sabres	385	---	385	41	130	---	171	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Scabbards	334	118	452	40	183	---	223	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sabre belts	334	94	428	40	229	---	269	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sabre belt plates	334	509	509	509	---	---	509	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sabre slings	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sabre knots	267	81	348	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Smith and Wesson revolvers, cal. 44	187	100	100	48	50	---	98	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Colt's pistols	22	16	203	1	59	---	60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Starr's pistols	---	---	---	---	1	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Smith and Wesson pistol holsters ^a	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Holsters	189	25	214	---	30	---	30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Screw-drivers	110	22	132	89	43	---	132	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Wrenches	---	---	11	---	3	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Extra cones	50	---	50	---	50	---	50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Bullet moulds.....	89	---	---	---	89	65	10	---	14	75
Saddles.....	277	---	27	---	304	40	264	---	---	304
Saddle covers.....	28	---	8	---	36	---	36	---	---	36
Saddle blankets.....	14	---	30	---	44	---	44	---	---	44
Saddle bags.....	15	---	5	---	20	20	---	---	---	20
Nose bags.....	---	---	6	---	6	---	---	6	---	---
Holders for saddles, pairs.....	---	---	7	---	7	7	---	---	---	7
4* Bridles.....	512	---	27	---	539	260	265	14	---	525
Halters.....	26	---	---	---	26	22	---	---	4	22
Breast straps and plates.....	362	---	2	---	364	135	229	---	---	364
Martingales.....	107	---	27	---	134	106	28	---	---	134
Ball cartridges, rounds, cal. 45.....	15,000	10,000	---	---	25,000	12,500	12,000	500	---	12,500
Ball cartridges, rounds, cal. 54.....	1,000	---	---	---	1,000	1,000	---	---	---	1,000
Ball cartridges, rounds, cal. 58.....	900	---	4,759	---	5,659	4,659	1,000	---	---	4,659
Smith and Wesson revolver cartridges, cal. 44.....	---	1,200	---	---	1,200	---	1,200	---	---	---
Uniform coats.....	907	---	202	---	1,109	225	884	---	---	1,109
Uniform pants.....	661	---	260	---	921	50	871	---	---	921
Uniform hats.....	568	---	373	---	941	160	781	---	---	941
Uniform caps.....	28	---	473	---	501	28	473	---	---	501
Blouses.....	---	---	84	---	84	---	84	---	---	84
Uniform jackets.....	86	---	---	---	86	26	51	---	9	77
Wall tents.....	66	---	---	---	66	49	12	3	2	64
Wall tent flies.....	48	---	---	---	48	36	9	3	---	48
Sibley tents.....	94	---	---	---	94	94	---	---	---	94
Hospital tents.....	3	---	3	---	3	3	---	---	---	3
Hospital tent flies.....	3	---	---	---	3	---	---	---	---	3
Tent poles, set.....	119	---	7	---	126	126	---	---	---	126

* Sold to municipal authorities of San Francisco.

† The amount in hands of National Guard of California is not included in this.

TABLE C.

List of ordnance, ordnance stores, etc., received from United States on account of State's quota.

September 20th, 1878—300 Springfield rifles, cal. 45: 300 bayonets, 200 Springfield carbines, cal. 45; 100 Smith & Wesson revolvers, cal. 44; 10,000 rifle ball cartridges, cal. 45; 1,200 Smith & Wesson revolver cartridges, cal. 44; 500 screw-drivers, 100 tumbler punches, 25 spring vises, 20 wiping rods, 200 brushes and thongs, 125 breech block cap screws, 125 cam latch springs, 125 ejector springs, 50 extractors, 125 firing pins, 125 firing pin screws, 125 firing pin springs, 125 main springs, 125 rear springs, 125 tumbler screws, 27 arm chests.

October 16th, 1878—200 carbine cartridge pouches, 200 pistol holsters (S. S. & W.), sold to municipal authorities of San Francisco.

June 30th, 1879—85 Springfield rifles, cal. 45: 85 bayonets, 4 arm chests.

The property invoiced June 20th, 1878, was not received, but was so invoiced to the State in obedience to instructions from Chief of Ordnance, it being a part of the plan by which the State's indebtedness of old stores was settled. A full explanation will be found in letters from Ordnance Department, on file in this office.

List of ordnance, ordnance stores, etc., returned to State Armory from companies of the National Guard of California, etc., from August 1st, 1877, to August 1st, 1879.

August 12th, 1877—Captain James Armstrong, commanding Hewston Guards, unattached, Second Brigade, N. G. C.: 2 bayonets, 13 cartridge boxes.

November 15th, 1877—Captain J. W. Guthrie, commanding Company "A," First Battalion of Infantry: 2 bayonets, 38 bayonet scabbards, 39 cartridge boxes and plates, 38 waist belts and plates.

November 16th, 1877—Captain C. A. Laufkotter, commanding Company "G," First Battalion of Infantry: 28 rifle muskets, cal. 58: 28 bayonets, 1 bayonet scabbard, 1 cartridge box and plate, 52 cartridge box belts, 1 waist belt and plate, 16 gun slings, 18 tompons.

November 16th, 1877—Captain J. M. Robbins, commanding Sacramento Light Artillery, attached, Fourth Brigade, N. G. C.: 21 sabres, 21 scabbards, 20 belts, 13 plates, 45 knots, 4 holsters, 4 linstocks.

November 24th, 1877—Captain Eugene Lehe, commanding Stockton Guard, unattached, Third Brigade, N. G. C.: 5 Springfield rifles, cal. 45; 5 bayonets, 10 bayonet scabbards, 10 cartridge boxes and plates, 6 Sergeants' swords.

March 12th, 1878—Captain F. W. Peirce, commanding late Company "B," Second Infantry: 43 Springfield rifles, cal. 45: 43 bayonets, 100 bayonet scabbards, 43 cartridge boxes, 52 cartridge box plates, 30 cartridge box belt plates, 57 waist belts, 54 waist belt plates, 13 cap pouches, 38 gun slings, 104 screw-drivers, 12 tumbler punches, 2 spring vises, 10 breech block cap screws, 10 cam latch springs, 10 ejector springs, 4 extractors, 10 firing pins, 10 firing pin screws, 10 firing pin springs, 18 main springs, 9 rear springs, 47 extra cones, 8 tumbler screws.

March 12th, 1878—Captain Charles Wochatz, commanding late Company "E," Second Infantry: 60 Springfield rifles, cal. 45; 58 bayonets, 31 bayonet scabbards, 31 waist belts, 31 waist belt plates, 44 screw-drivers, 12 tumbler punches, 14 breech block cap screws, 7 cam latch springs, 6 extractors, 11 firing pins, 14 firing pin screws, 15 firing pin springs, 15 main springs, 15 rear springs, 12 tumbler screws, 3 arm chests.

April 23d, 1878—Captain John A. Rapp, commanding Nevada Light Guard, Company "C," First Battalion of Infantry: 60 bayonet scabbards, 60 cartridge boxes and plates, 51 cartridge box belts, 57 waist belts and plates.

May 31st, 1878—Captain J. P. Brown, commanding Yuba Light Infantry, Company "E," First Battalion of Infantry: 50 bayonet scabbards, 48 waist belts, 47 waist belt plates.

August 21st, 1878—Cressler and Bonner, Cedarville, Modoc County, California: 60 Springfield rifles, cal. 58; 57 bayonets, 3,000 ball cartridges, cal. 45.

August 29th, 1878—Captain C. A. Laufkotter, commanding Sarsfield Guard, Company "G," First Battalion of Infantry: 1 Springfield rifle, cal. 45; 1 Springfield rifle, cal. 58.

September 10th, 1878—Captain J. Stuart, commanding National Guard, Company "C," First Infantry: 2 Springfield rifles, cal. 45; 2 bayonets.

September 18th, 1878—Captain H. P. Bush, commanding Hewston Rifles, Company "H," First Infantry: 2 cartridge boxes, 1 cartridge box plate, 2 Sibley tents, 2 poles, 75 tent pins.

November 19th, 1878—Captain John Stuart, commanding National Guard, Company "C," First Infantry: 2 wall tents, 2 wall tent flies, 10 Sibley tents, 10 Sibley tent poles, 280 tent pins.

November 24th, 1878—Cressler and Bonner, Cedarville, Modoc County, California: 40 Springfield carbines, cal. 45; 1,880 ball cartridges, cal. 45; 2 arm chests.

November 27th, 1878—State Engineer's Department: 3 Sibley tents, 3 poles.

January 10th, 1879—Captain F. O'Grady, commanding Vallejo Rifles, unattached, Second Brigade, N. G. C.: 60 Springfield rifles, cal. 58; 57 bayonets, 60 gun slings, 3 arm chests.

January 11th, 1879—Captain H. Schaffner, commanding Company "B," 2d Infantry: 1 Springfield rifle, cal. 45.

February 3d, 1879—Captain T. W. Sheehan, Sarsfield Guard, Company "G," 1st Battalion of Infantry: 30 Whitney rifles, 7 gun slings.

May 13th, 1879—Late Siskiyou Guard, unattached, 5th Brigade, N. G. C.: 55 Springfield rifles, cal. 58; 54 bayonets, 54 bayonet scabbards, 54 cartridge boxes and plates, 54 waist belts and plates, 54 cap boxes and picks, 55 gun slings, 51 screw-drivers, 37 tompons, 53 extra cones, 10 tumbler punches, 1 ball screw, 2 spring vises, 15 extra main springs, 8 extra sear springs, 13 extra tumbler screws, 3 arm chests, 1 box.

June 17th, 1879—State Engineer's Department: 2 wall tents, 2 flies, 2 ridge poles, 4 uprights.

List of ordnance, ordnance stores, etc., issued to companies of the National Guard of California, etc., from August 1st, 1877, to August 1st, 1879.

September 15th, 1877—Captain C. A. Laufkotter, commanding Sarsfield Guard, Company "G," First Battalion of Infantry: 4 Springfield rifles, cal. 45; 4 bayonets.

January 2d, 1878—Captain H. W. Gray, commanding First Light Dragoons, Company "A," First Cavalry Battalion: 40 Springfield carbines, cal. 45; 2 arm chests.

January 2d, 1878—Captain C. C. Keene, commanding San Francisco Hussars, Company "B," First Cavalry Battalion: 40 Springfield carbines, cal. 45; 2 arm chests.

January 2d, 1878—Captain M. Greany, commanding Jackson Dragoons, Company "C," First Cavalry Battalion: 40 Springfield carbines, cal. 45; 2 arm chests.

January 2d, 1878—Captain H. D. Ranlett, commanding Oakland Guard, unattached, Second Brigade, N. G. C.: 100 Springfield rifles, cal. 45; 100 bayonets, 5 arm chests.

January 22d, 1878—Captain R. G. Brush, commanding First California Guard, unattached, Second Brigade, N. G. C.: 40 Smith & Wesson revolvers, cal. 44; 480 rounds cartridges, cal. 44; 1 arm chest.

May 4th, 1878—Captain Eugene Lehe, commanding Stockton Guard, unattached, Third Brigade, N. G. C.: 5 Springfield rifles, cal. 45; 5 bayonets, 10 bayonet scabbards, 10 cartridge boxes and plates, 1 arm chest.

May 22d, 1878—Captain F. O'Grady, commanding Vallejo Rifles, unattached, Second Brigade, N. G. C.: 60 Springfield rifles, cal. 45; 60 bayonets, 3 arm chests.

June 13th, 1878—Captain F. W. Peirce, commanding Company "B," Second Infantry Regiment: 43 Springfield rifles, cal. 45; 43 bayonets, 100 bayonet scabbards, 43 cartridge boxes, 52 cartridge box plates, 30 cartridge box belt plates, 57 waist belts, 54 waist belt plates, 13 cap boxes and picks, 38 gun slings, 94 screw-drivers, 12 tumbler punches, 2 spring vises, 10 breech block cap screws, 10 cam latch springs, 10 ejector springs, 4 extractors, 10 firing pins, 10 firing pin screws, 10 firing pin springs, 18 main springs, 9 sear springs, 8 tumbler screws.

June 28th, 1878—Captain F. W. Bacon, commanding Company "F," Second Infantry Regiment: 100 Springfield rifles, cal. 45; 100 bayonets, 5 arm chests.

June 29th, 1878—Captain A. J. Fritz, commanding Union Guard, Company "A," Gatling Battery: 40 Springfield rifles, cal. 45; 40 bayonets, 2 arm chests.

July 2d, 1878—State Engineer's Department: 5 wall tents, 5 wall tent flies, 5 ridge poles, 10 uprights.

July 6th, 1878—Cressler and Bonner, Cedarville, Modoc County, California: 60 Springfield rifles, cal. 45; 60 bayonets, 40 Springfield carbines, cal. 45; 5,000 rounds ball cartridges, cal. 45; 5 arm chests, 5 boxes.

July 29th, 1878—Captain C. A. Laufkotter, commanding Sarsfield Guard, Company "G," First Battalion of Infantry: 30 Whitney rifles, cal. 54.

August 30th, 1878—Captain C. A. Laufkotter, commanding Sarsfield Guard, Company "G," First Battalion of Infantry: 6 ejector springs, 6 firing pins, 6 firing pin springs.

September 16th, 1878—Captain C. A. Laufkotter, commanding Sarsfield Guard, Company "G," First Battalion of Infantry: 5 Springfield rifles, cal. 45; 5 bayonets.

October 17th, 1878—Captain W. C. Little, commanding Oakland Light Cavalry, unattached, Second Brigade, N. G. C.: 40 Springfield carbines, cal. 45; 2 arm chests.

November 21st, 1878—Captain H. W. Gray, commanding First Light Dragoons, Company "A," First Cavalry Battalion: 30 screw-drivers, 6 tumbler punches, 7 main springs, 7 sear springs, 7 tumbler screws, 3 extractors, 40 wipers and thongs, 7 ejector springs, 7 cam latch springs, 7 firing pins, 7 firing pin springs, 7 firing pin screws, 3 breech block cap screws, 4 wiping rods, 2 spring vises.

November 21st, 1878—Captain C. C. Keene, commanding San Francisco Hussars, Company "B," First Cavalry Battalion: 30 screw-drivers, 6 tumbler punches, 7 main springs, 7 sear springs, 7 tumbler screws, 3 extractors, 40 wipers and thongs, 7 ejector springs, 7 cam latch springs, 7 firing pin springs, 7 firing pin screws, 3 breech block cap screws, 4 wiping rods, 2 spring vises.

November 21st, 1878—Captain M. Greany, commanding Jackson Dragoons, Company "C," First Cavalry Battalion: 30 screw-drivers, 6 tumbler punches, 7 main springs, 7 sear springs, 7 tumbler screws, 3 extractors, 40 wipers and thongs, 7 ejector springs, 7 cam latch springs, 7 firing pins, 7 firing pin springs, 7 firing pin screws, 3 breech block cap screws, 4 wiping rods, 2 spring vises.

November 23d, 1878—Captain Eugene Lehe, commanding Stockton Guard, unattached, Third Brigade, N. G. C.: 30 Whitney rifles, cal. 54; 30 cartridge boxes and plates, 30 waist belts and plates, 2 arm chests.

December 3d, 1878—Captain William H. Chamberlain, commanding Company "G," Second Infantry Regiment: 50 Springfield rifles, cal. 45; 50 bayonets, 3 arm chests.

December 31st, 1878—Captain William H. Chamberlain, commanding Company "G," Second Infantry Regiment: 1 extractor, 1 firing pin, 1 sear spring.

January 21st, 1879—Captain F. W. Bacon, commanding Company "F," Second Infantry Regiment: 75 screw-drivers, 5 extractors, 12 ejector springs, 12 cam latch springs, 15 tumbler punches, 12 firing pins, 12 firing pin springs, 12 firing pin screws, 5 spring vises, 12 breech block cap screws, 15 extra main springs, 15 extra sear springs, 12 extra tumbler screws.

January 22d, 1879—Captain F. O'Grady, commanding Vallejo Rifles, unattached, Second Brigade, N. G. C.: 20 screw-drivers, 2 extractors, 10 ejector springs, 10 cam latch springs, 7 tumbler punches, 10 firing pin springs, 10 firing pin screws, 10 firing pins, 3 spring vises, 3 breech block cap screws, 10 extra main springs, 10 extra sear springs, 10 extra tumbler screws.

March 20th, 1879—Captain William T. Turner, commanding Chico Guard, unattached, Fifth Brigade, N. G. C.: 5 Springfield rifles, cal. 45; 5 firing pins, 500 rounds ball cartridges, cal. 45; 1 box.

April 10th, 1879—Captain F. J. Kearney, commanding City Guard, Company "A," First Battalion of Infantry: 20 smooth bore muskets, cal. 69; 20 bayonets.

April 28th, 1879—Captain T. W. Sheehan, commanding Sarsfield Guard, Company "G," First Battalion of Infantry: 25 smooth bore muskets, cal. 69; 25 bayonets, 10 firing pins, 10 firing pin springs, 5 extractors, 15 Zouave jackets.

June 4th, 1879—Captain Alex. Campbell, commanding Eureka Guards, unattached, Sixth Brigade, N. G. C.: 60 Springfield rifles, cal. 58; 60 bayonets, 60 bayonet scabbards, 60 cartridge boxes and plates, 60 waist belts and plates, 54 cap boxes and picks, 20 screw-drivers, 60 wipers, 60 tompons, 20 extra cones, ten tumbler punches, 2 spring vises, 10 extra main springs, 10 extra sear springs, 10 extra tumbler screws, 1,000 rounds ball cartridges, cal. 58; 3 arm chests, 1 box.

June 24th, 1879—Captain P. M. Darcy, commanding Los Angeles Guard, unattached, First Brigade, N. G. C.: 12 bayonet scabbards, 12 cartridge boxes and plates, 12 waist belts and plates, 16 Zouave jackets.

June 30th, 1879—Captain A. J. Fritz, commanding Union Guard, Company "A," Gatling Battery: 10 extractors, 15 firing pins, 15 firing pin springs, 20 Zouave jackets, 10 saddles, 10 bridles, 10 breast straps and plates.

June 30th, 1879—Captain P. M. Darcy, commanding Los Angeles Guard, unattached, First Brigade, N. G. C.: 45 Springfield rifles, cal. 45; 45 bayonets, 1,000 rounds ball cartridges, cal. 45; 1 box, 2 arm chests.

June 30th, 1879—Captain William T. Turner, commanding Chico Guard, unattached, Fifth Brigade, N. G. C.: 40 Springfield rifles, cal. 45; 40 bayonets, 2 arm chests.

July 8th, 1879—Captain J. H. McMenomy, commanding McMabon Guard, Company "H," Third Infantry Regiment: 40 bayonet scabbards, 40 waist belts and plates.

List of ordnance, ordnance stores, etc., forwarded direct to Benicia Arsenal by companies of the National Guard of California, as per acknowledgments of Colonel J. McAllister, 1877-78.

Oakland Guard, unattached, Second Brigade, N. G. C.: 75 Springfield rifles, cal. 58; 1,978 cartridges, cal. 58; 77 cap boxes and picks, 71 gun slings, 9 ball screws, 61 screw-drivers, 2 spring vises, 57 tompons, 15 tumbler punches, 124 wipers, 3 bayonets, 21 main springs, 21 sear springs, 20 tumbler screws, 4 arm chests.

Vallejo Rifles, unattached, Second Brigade, N. G. C.: 51 bayonet scabbards, 42 cap boxes, 58 cartridge boxes, 56 cartridge box plates, 57 cartridge box belts, 53 cartridge box belt plates, 85 waist belts, 82 waist belt plates, 2 ball screws, 44 screw-drivers, 8 tumbler punches, 35 wipers, 53 extra cones, 13 extra main springs, 12 extra sear springs, 10 extra tumbler screws, 1 non-commissioned officer's sword belt and plate.

Franklin Light Infantry, Company "D," First Infantry: 23 bayonet scabbards, 3 cap pouches, 21 cartridge boxes, 18 cartridge box plates, 3 non-commissioned officers' swords.

Summer Light Guard, Company "E," First Infantry: 94 bayonet scabbards, 83 cap pouches, 87 cartridge boxes, 81 cartridge box plates, 64 waist belts, 57 waist belt plates.

Light Guard, Company "F," First Infantry: 87 bayonet scabbards, 73 cap pouches, 73 cartridge boxes, 80 cartridge box plates, 156 waist belts, 146 waist belt plates.

Hewston Rifles, Company "H," First Infantry: 81 bayonet scabbards, 78 cartridge boxes, 75 cartridge box plates, 1 gun sling, 75 waist belts, 74 waist belt plates.

Union Guard, Company "A," Second Infantry: 38 bayonet scabbards, 50 cap pouches, 50 cartridge boxes, 56 cartridge box plates, 50 cartridge box belt plates, 126 gun slings, 33 waist belts, 33 waist belt plates, 52 screw-drivers, 43 tompons.

Company "B," Second Infantry: 25 bayonet scabbards, 101 cap pouches, 47 cartridge boxes, 47 cartridge box plates, 126 cartridge box belts, 67 cartridge box belt plates, 34 gun slings, 41 waist belts, 59 waist belt plates, 18 bayonets.

San Francisco Fusileers, Company "C," Second Infantry: 40 bayonet scabbards, 73 cap pouches, 80 cartridge boxes, 79 cartridge box plates, 140 gun slings, 40 waist belts, 40 waist belt plates, 22 ball screws, 48 screw-drivers, 24 tumbler punches, 24 wipers, 78 cones, 12 main springs, 12 sear springs.

Germania Rifles, Company "D," Second Infantry: 23 bayonet scabbards, 53 cap pouches, 65 cartridge boxes, 59 cartridge box plates, 5 waist belts, 5 waist belt plates.

Steuben Guard, Company "E," Second Infantry: 23 bayonet scabbards, 61 cap pouches, 59 cartridge boxes, 56 cartridge box plates, 102 cartridge box belts, 56 cartridge box belt plates, 38 gun slings, 12 waist belts, 12 waist belt plates, 8 tompons.

San Francisco Cadets, Company "H," Second Infantry: 70 cap pouches, 69 cartridge boxes, 66 cartridge box plates, 81 cartridge box belts, 79 cartridge box belt plates, 40 gun slings.

Montgomery Guard, Company "A," Third Infantry: 44 bayonet scabbards, 74 cap pouches, 79 cartridge boxes, 78 cartridge box plates, 60 gun slings, 39 waist belts, 39 waist belt plates, 3 ball screws, 29 screw-drivers, 54 tompons, 11 tumbler punches, 12 wipers, 62 cones, 16 main springs, 9 sear springs, 12 tumbler screws.

Shields Guard, Company "B," Third Infantry: 55 bayonet scabbards, 33 cap pouches, 75 cartridge boxes, 71 cartridge box plates, 28 cartridge box belts, 25 cartridge box belt plates, 40 waist belts, 38 waist belt plates, 75 tompons.

Meagher Guard, Company "D," Third Infantry: 47 bayonet scabbards, 55 cap pouches, 50 cartridge boxes, 48 cartridge box plates, 46 gun slings, 41 waist belts, 41 waist belt plates, 3 ball screws, 23 screw-drivers, 27 tompons, 5 tumbler punches, 33 cones, 7 main springs, 10 sear springs, 10 tumbler screws.

Emmet Guard, Company "E," Third Infantry: 53 bayonet scabbards, 70 cap pouches, 70 cartridge boxes, 70 cartridge box plates, 76 cartridge box belts, 78 cartridge box belt plates.

McMahon Guard, Company "H," Third Infantry: 107 bayonet scabbards, 104 cap pouches, 130 cartridge boxes, 78 cartridge box plates, 93 cartridge box belts, 99 cartridge box belt plates, 70 waist belts, 70 waist belt plates.

Los Angeles Guard, unattached, First Brigade, N. G. C.: 15 Springfield rifles, cal. 58; 11 bayonets, 11 bayonet scabbards, 6 cap pouches, 12 cartridge boxes, 8 cartridge box plates, 4 gun slings, 5 waist belts, 3 waist belt plates.

Chico Guard, unattached, Fifth Brigade, N. G. C.: 20 Springfield rifles, cal. 58; 20 bayonet scabbards, 20 cap pouches, 20 cartridge boxes, 20 cartridge box belts, 20 gun slings, 20 waist belts, 20 waist belt plates, 1 arm chest.

Nevada Light Guard, Company "C," First Battalion of Infantry: 20 bayonet scabbards, 76 cap pouches, 20 cartridge boxes, 20 cartridge box plates, 20 cartridge box belts, 20 waist belts, 19 waist belt plates.

Placerville City Guard, Company "D," First Battalion of Infantry: 20 bayonet scabbards, 66 cap pouches, 69 cartridge boxes, 69 cartridge box plates, 69 cartridge box belts, 69 cartridge box belt plates, 4 gun slings, 10 waist belts, 10 waist belt plates, 5 sword belts.

Yuba Light Infantry, Company "E," First Battalion of Infantry: 10 bayonet scabbards, 60 cap pouches; 60 cartridge boxes, 60 cartridge box plates, 60 cartridge box belts, 60 cartridge box belt plates, 60 gun slings, 10 waist belts, 10 waist belt plates.

San José Zouaves, unattached, Second Brigade, N. G. C.: 29 Springfield rifles, cal. 58; 25 bayonet scabbards, 24 cap pouches, 29 cartridge boxes, 29 cartridge box plates, 32 cartridge box belts, 21 cartridge box belt plates, 27 gun slings, 40 waist belts, 28 waist belt plates, 26 bayonets, 5 extra cones.

First Cavalry Battalion: 37 cartridge boxes; 35 cartridge box plates. This property was forwarded by First Cavalry Battalion, but belonged to the Second Infantry, and has been credited thereto.

First Light Dragoons, Company "A," First Cavalry Battalion: 55 cap pouches, 30 Colt's pistols, cal. 44; 53 cavalry sabres, 33 pistol holsters, 48 sabre belts, 34 sabre belt plates, 67 sabre knots, 98 sabre slings, 13 bullet moulds, cal. 44; 23 screw-drivers, cal. 44; 1 arm chest.

San Francisco Hussars, Company "B," First Cavalry Battalion: 31 Colt's pistols, cal. 44; 39 pistol holsters, 22 bullet moulds, cal. 44; 45 screw-drivers, cal. 44; 1 arm chest.

Jackson Dragoons, Company "C," First Cavalry Battalion: 13 Colt's pistols, cal. 44; 36 cavalry sabres, 15 pistol holsters, 1 sabre (horse artillery), 64 sabre slings, 2 arm chests.

First California Guard, unattached, Second Brigade, N. G. C.: 1 gunner's haversack, 9 prining wires, 1 sponge and rammer, 3 tarpaulins, 1 worm and staff, 1 lanyard, 57 cavalry sabres, 9 pistol holsters; 135 sabre knots, 14 watering bridles, 1 horse brush, 6 nose bags, 6 picket pins.

General John Hewston, late Brigadier-General, Second Brigade, N. G. C.: 21 Starr's pistols, 21 pistol holsters.

The following was forwarded direct to Benicia Arsenal by colleges, etc., and credit given on books of Adjutant-General's office:

Santa Clara College: 39 bayonet scabbards, 39 cartridge boxes, 39 cartridge box plates, 39 cap boxes, 40 gun slings, 39 waist belts, 40 Harper's Ferry rifles, cal. 54; 2 ball screws, 3 spring vises, 3 bullet moulds, cal. 54; 38 sword bayonets.

University of California: 2 Springfield rifles, cal. 58; 3,618 ball cartridges, cal. 58; 129 bayonet scabbards, 161 cartridge boxes, 165 cartridge box plates, 138 cartridge box belts, 184 cartridge box belt plates, 153 cap boxes, 111 gun slings; 150 waist belts, 135 waist belt plates, 21 ball screws, 99 screw-drivers, 17 spring vises, 108 tompons, 18 tumbler punches, 14 wipers, 31 extra cones, 46 extra main springs, 50 extra sear springs, 46 tumbler screws, 2 non-commissioned officers' swords, 1 frog for sword, 1 arm chest.

List of ordnance, ordnance stores, etc., forwarded from State Armory to Benicia Arsenal in liquidation of the State's indebtedness, as per acknowledgment of Colonel J. McAllister.

142 Springfield rifles, cal. 58; 800 bayonet scabbards, 423 cartridge boxes, 304 cartridge box plates, 191 cartridge box belts, 155 cartridge box belt plates, 560 cap boxes, 125 gun slings, 345 waist belts, 208 waist belt plates, 6 arm chests, 69 Colt's pistols, 59 cavalry sabres, 67 pistol holsters, 181 sabre belts, 125 sabre belt plates, 143 sabre knots, 3 tow hooks, 4 thumb stalls, 1 tangent scale, 14 lariats.

The following articles, forwarded to Benicia Arsenal, being in excess of State indebtedness, were returned to the State Armory :

2 smooth-bore muskets, cal. 69; 32 bayonets, cal. 58; 26 cartridge boxes and plates, 356 screw-drivers, 209 wipers, 372 tompons, 257 extra cones, 81 tumbler punches, 62 ball screws, 22 spring vises, 5 Sergeants' swords, 6 sword belts, 115 extra main springs, 114 extra sear springs, 98 extra tumbler screws, 1 sabre (horse artillery), 1 non-commissioned officers' belt and plate, 6 holsters, pairs for saddle; 68 screw-drivers, cal. 44; 38 bullet moulds, 2 arm chests, 509 sabre slings, 1 frog for sword, 40 Harper's Ferry rifles, cal. 54; 38 sword bayonets, 5,596 cartridges, cal. 58; paper.

For complete statement of property returned to Benicia Arsenal, see Table B, "Military property of the State."

TABLE D.

Annual Return of the National Guard of California, compiled from the reports of September 9th, 1878.

LOCALITY.	Aggregate	Non-commissioned Officers	Aids-de-Camp	Ordnance Department	Engineer's Department	Pay Department	Medical Department	Subsistence Department	Quartermaster's Department	Judge Advocate's Department	Inspector-General's Department	Adjutant-General's Department	Brigadier-Generals	Major-Generals	Number of Companies
Staff of the Commander-in-Chief	11		6		1	1				1	1	1			
Adjutant-General's Department	1				1	1				1	1	1			
Major-General Commanding National Guard of California and Staff	13		2	1	1	1	1	1	1	1	2	2	1	1	1
San Francisco	14	2	1	1	1	1	1	1	1	1	2	2	1	1	28
San Luis Obispo	14		1	1	1	1	1	1	1	1	2	2	1	1	1
San Francisco	12		1	1	1	1	1	1	1	1	2	2	1	1	6
Stockton	12		1	1	1	1	1	1	1	1	2	2	1	1	2
Sacramento	12		1	1	1	1	1	1	1	1	2	2	1	1	2
Red Bluff	11		1	1	1	1	1	1	1	1	1	1	1	1	
Brigadier-General Commanding Fifth Brigade, N. G. C.	11		1	1	1	1	1	1	1	1	1	1	1	1	
Brigadier-General Commanding Sixth Brigade, N. G. C.	11		1	1	1	1	1	1	1	1	1	1	1	1	
Totals	100	4	14	7	8	8	7	7	7	8	14	9	6	1	38

Vallejo	Vallejo Rifles, unattached								1	1	1	15	46	64
San José	San José Zouaves, unattached								1	1	1	16	61	80
San Francisco	Union Guard, Company "A," Gatling Battery								1	2	2	23	73	101
San Francisco	First California Guard, unattached								1	2	2	18	40	63
San Francisco	First Cavalry Battalion													5
	Company "A," First Light Dragoons								1	1	2	11	45	60
	Company "B," San Francisco Hussars								1	1	2	11	65	80
	Company "C," Jackson Dragoons								1	1	2	11	43	58
Stockton	Stockton Guard, unattached								1	1	1	17	63	83
<i>Fourth Brigade.</i>														
Sacramento	First Battalion of Infantry								1	1	1			6
Nevada City	Company "A," City Guard											14	42	59
Placerville	Company "C," Nevada Light Guard								1	1	1	16	55	74
Campconville	Company "D," Placerville City Guard								1	1	1	16	55	74
Sacramento	Company "E," Yuba Light Infantry								1	1	1	18	54	75
Sacramento	Company "G," Sossfield Guard								1	1	1	14	53	70
Sacramento	Sacramento Light Artillery, unattached								1	2	2	14	37	56
<i>Fifth Brigade.</i>														
Chico	Chico Guard, unattached											11	44	58
Yreka	Siskiyou Guard, unattached								1	1	1	14	53	70
From page 31														
	Totals	3	3	5	4	5	5	4	3	40	43	595	1,810	2,564
		3	3	5	4	5	5	4	3	40	43	595	1,810	2,664

TABLE E.

Enrolled Militia of California for the years 1877 and 1878.

COUNTIES.	Number enrolled in 1877	Number enrolled in 1878	COUNTIES.	Number enrolled in 1877	Number enrolled in 1878
Alameda	4,527	4,686	Sacramento	5,682	3,936
Alpine	149	131	San Benito	688	650
Amador *		2,108	San Bernardino	1,395	1,865
Butte	1,808	973	San Diego †	1,792	
Calaveras	1,050	1,061	San Francisco	32,549	32,750
Colusa	2,002	1,016	San Joaquin	4,216	4,303
Contra Costa	1,872	1,972	San Luis Obispo	1,710	1,962
Del Norte	254	265	San Mateo	1,846	1,703
El Dorado	1,802	1,830	Santa Barbara	1,816	1,616
Fresno	1,000	864	Santa Clara	1,512	2,864
Humboldt	1,665	2,050	Santa Cruz	1,914	2,048
Inyo	979	1,030	Shasta	746	698
Kern	697	721	Sierra	931	880
Lake	818	769	Siskiyou	1,446	1,151
Lassen	544	473	Solano	1,232	1,330
Los Angeles	4,791	5,911	Sonoma	2,490	2,603
Marin	1,723	1,650	Stanislaus	530	717
Mariposa	500	408	Sutter	961	746
Mendocino	2,661	2,613	Tehama	1,247	1,885
Merced	1,045	1,009	Trinity	589	582
Modoc	578	711	Tulare	1,347	1,299
Mono	377	409	Tuolumne	490	421
Monterey	1,989	1,920	Ventura	683	755
Napa	1,219	1,354	Yolo	1,719	1,430
Nevada	3,421	3,375	Yuba	1,723	1,229
Placer	2,305	2,344			
Plumas	680	772	Totals	111,710	111,848

* No returns from Amador County for 1877.

† No returns from San Diego County for 1878.

TABLE F.

Consolidated report of target practice held during the month of May, 1878—Distance, 200 yards for Springfield breech-loading rifles and carbines, 150 yards for muzzle-loaders—Size of target, 6 feet by 4.

NAME OF COMPANY.	Regiment or Battalion.	Brigade	Style of Arms	Number of Men Firing	Number of Points Possible to be Made.	Number of Points Made	Company Percentage.
Los Angeles Guard, unattached	First Infantry	First.	Springfield rifle, m. l., cal. 68.	42	1,050	349	33.23
City Guard, Company "B"*	First Infantry	Second	Springfield rifle, b. l., cal. 45	39	975	580	59.48
National Guard, Company "C"	First Infantry	Second					
Franklin Light Infantry, Company "D"*	First Infantry	Second					
Summer Light Guard, Company "E"*	First Infantry	Second					
Light Guard, Company "F"*	First Infantry	Second					
Hewston Rifles, Company "H"*	First Infantry	Second					
Union Guard, Company "A"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	42	1,050	694	66.09
Company "B"	Second Infantry	Second					
San Francisco Fusileers, Company "C"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	56	1,400	740	52.85
Germania Rifles, Company "D"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	37	925	457	49.40
Company "F"†	Second Infantry	Second					
San Francisco Cadets, Company "H"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	50	1,250	465	37.2
Montgomery Guard, Company "A"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	23	575	355	58.26
Shields Guard, Company "B"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	36	900	424	47.11
Wolfe Tone Guard, Company "C"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	32	800	332	41.5
Mengler Guard, Company "D"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	29	725	367	50.62
Emmet Guard, Company "E"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	32	800	119	14.87
McMahon Guard, Company "H"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	36	900	492	54.66
Hewston Guard, unattached		Second	Springfield rifle, b. l., cal. 50	33	825	394	47.75
Oakland Guard, unattached		Second	Springfield rifle, b. l., cal. 45	46	1,150	601	52.26
Vallejo Rifles, unattached		Second	Springfield rifle, b. l., cal. 45	44	1,100	353	32.09
San José Zouaves, unattached		Second	Springfield rifle, b. l., cal. 45	34	850	260	30.58

* Reports not approved by General Inspector of Rifle Practice.

† No arms issued to company until June 28th, 1878.

TABLE F—Continued.

NAME OF COMPANY.	Regiment or Battalion.	Brigade	Style of Arms	Number of Men Firing.	Number of Points Possible to be Made.	Number of Points Made.	Company Percentage.
First Light Dragoons, Company "A"-----	First Cavalry Battalion-----	Second-----	Springfield carbine, cal. 45.-----	33	825	353	42.78
San Francisco Hussars, Company "B"-----	First Cavalry Battalion-----	Second-----	Springfield carbine, cal. 45.-----	47	1,175	408	34.72
Jackson Dragoons, Company "C"-----	First Cavalry Battalion-----	Second-----	Springfield rifle, b. l., cal. 45.-----	34	850	299	34.58
Stockton Guard, unattached-----	First Cavalry Battalion-----	Third-----	Springfield rifle, b. l., cal. 45.-----	58	1,450	508	39.17
City Guard, Company "A"-----	First Battalion of Infantry-----	Fourth-----	Springfield rifle, b. l., cal. 45.-----	37	925	479	51.78
Nevada Light Guard, Company "C"-----	First Battalion of Infantry-----	Fourth-----	Springfield rifle, b. l., cal. 45.-----	46	1,150	588	51.13
Placerville City Guard, Company "D"-----	First Battalion of Infantry-----	Fourth-----	Springfield rifle, b. l., cal. 45.-----	45	1,125	374	33.24
Yuba Light Infantry, Company "E"-----	First Battalion of Infantry-----	Fourth-----	Springfield rifle, b. l., cal. 45.-----	51	1,275	709	55.60
Sarsfield Guard, Company "G"-----	First Battalion of Infantry-----	Fourth-----	Springfield rifle, b. l., cal. 45.-----	37	925	502	54.27
Chico Guard, unattached-----	First Battalion of Infantry-----	Fifth-----	Springfield rifle, m. l., cal. 58.-----	42	1,050	414	39.42

TABLE F—Continued.

Consolidated report of target practice held during the month of May, 1879.—Distance, 200 yards for Springfield breech-loading rifles and carbines, 150 yards for muzzle-loaders—Size of target, 6 feet by 4.

NAME OF COMPANY.	Regiment or Battalion.	Brigade	Style of Arms	Number of Men Firing.	Number of Points Possible to be Made.	Number of Points Made	Company Percentage.
Los Angeles Guard, unattached.	First Infantry	First	Springfield rifle, m. l., cal. 58.	38	950	366	38.52
City Guard, Company "B"	First Infantry	Second	Springfield rifle, b. l., cal. 45	29	725	302	41.65
National Guard, Company "C"	First Infantry	Second	Springfield rifle, b. l., cal. 45	44	1,100	631	57.36
Franklin Light Infantry, Company "D"	First Infantry	Second	Springfield rifle, b. l., cal. 45	41	1,025	390	38.04
Sumner Light Guard, Company "E"	First Infantry	Second	Springfield rifle, b. l., cal. 45	41	1,025	611	59.60
Light Guard, Company "F"	First Infantry	Second	Springfield rifle, b. l., cal. 45	29	725	342	47.17
Hewston Rifles, Company "H"	First Infantry	Second	Springfield rifle, b. l., cal. 45	41	1,025	438	42.73
—, Company "B"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	44	1,100	243	22.09
San Francisco Fusileers, Company "C"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	56	1,400	615	43.92
Germania Rifles, Company "D"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	51	1,275	602	47.21
—, Company "F"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	54	1,350	612	45.33
—, Company "G"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	23	575	242	42.08
San Francisco Cadets, Company "H"	Second Infantry	Second	Springfield rifle, b. l., cal. 45	46	1,150	539	46.86
Montgomery Guard, Company "A"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	37	925	410	44.32
Shields Guard, Company "B"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	37	925	462	49.94
Wolfe Tone Guard, Company "C"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	22	550	285	51.81
Meagher Guard, Company "D"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	33	825	315	38.18
Enmet Guard, Company "E"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	36	900	517	57.44
McMahon Guard, Company "H"	Third Infantry	Second	Springfield rifle, b. l., cal. 45	29	725	364	50.20
Union Guard, Company "A," Gatling Battery	Third Infantry	Second	Springfield rifle, b. l., cal. 45	100	2,500	1,025	41.00
Hewston Guard, unattached	—	Second	Springfield rifle, b. l., cal. 50	36	900	483	53.66
Oakland Guard, unattached	—	Second	Springfield rifle, b. l., cal. 45	57	1,425	828	58.10
Vallejo Rifles, unattached	—	Second	Springfield rifle, b. l., cal. 45	53	1,325	446	33.66
San José Zouaves, unattached	—	Second	Springfield rifle, m. l., cal. 58	34	850	330	38.82
First Light Dragoons, Company "A"	First Cavalry Battalion	Second	Springfield carbine, cal. 45	38	950	384	40.42
San Francisco Hussars, Company "B"	First Cavalry Battalion	Second	Springfield carbine, cal. 45	36	900	283	31.44

TABLE F—Continued.

NAME OF COMPANY.	Regiment or Battalion.	Brigade.	Style of Arms.	Number of Men Firing.	Number of Points Possible to be Made.	Number of Points Made.	Company Percentage.
Jackson Dragoons, Company "C"	First Cavalry Battalion	Second	Springfield carbine, cal. 45	31	775	260	33.54
Oakland Light Cavalry, unattached ^a		Second	Springfield carbine, cal. 45	61	1,525	664	43.54
Stockton Guard, Company "A"		Third	Springfield rifle, b. l., cal. 45				
City Guard, Company "A"	First Battalion of Infantry	Fourth	Springfield rifle, b. l., cal. 45	47	1,175	541	46.04
Nevada Light Guard, Company "C"	First Battalion of Infantry	Fourth	Springfield rifle, b. l., cal. 45	53	1,325	552	41.66
Placerville City Guard, Company "D"	First Battalion of Infantry	Fourth	Springfield rifle, b. l., cal. 45	38	950	371	39.05
Yuba Light Infantry, Company "E"	First Battalion of Infantry	Fourth	Springfield rifle, b. l., cal. 45	41	1,025	338	32.97
Sarsfield Guard, Company "G"	First Battalion of Infantry	Fourth	Springfield rifle, b. l., cal. 45	42	1,050	559	53.23
Chico Guard, unattached		Fifth	Springfield rifle, b. l., cal. 45	33	825	331	40.12

^a Not reported.

TABLE G.
Roster of the National Guard of California, July 31st, 1879.

NAME.	Grade.	Date of Rank.	Date of Commission.	Residence.	Remarks.
His Excellency, William Irwin, Governor and Commander-in-Chief P. F. Walsh, Adjutant-General, ex officio Chief of Staff, Quartermaster-General, Commissary-General, Inspector-General, and Chief of Ordnance.	Brigadier-General	Dec. 13, 1875	Dec. 13, 1875	Sacramento	
<i>General Staff.</i>					
Chalmers Scott, Chief Engineer William Harney, Paymaster-General B. D. Murphy, Judge Advocate-General James A. Laven, Inspector-General of Rifle Practice _____, Surgeon-General	Colonel Colonel Colonel Colonel	May 4, 1876 May 4, 1876 May 4, 1876 April 27, 1878	May 17, 1876 May 17, 1876 May 17, 1876 April 29, 1878	San Luis Rey San Francisco San José San Francisco	
<i>Aids-de-Camp.</i>					
O. Livermore James C. Logan J. Henry Smith James H. Budd Charles E. Travers Abraham Newman	Lieutenant-Colonel Lieutenant-Colonel Lieutenant-Colonel Lieutenant-Colonel Lieutenant-Colonel	May 4, 1876 May 4, 1876 May 4, 1876 May 17, 1876 May 4, 1876 May 17, 1876	May 17, 1876 May 17, 1876 May 17, 1876 May 17, 1876 May 17, 1876 May 17, 1876	San Francisco Oroville San Francisco Stockton San Francisco San Francisco	
<i>Staff Adjutant-General.</i>					
P. J. Harney, Assistant Adjutant-General <i>Major-General Commanding N. G. C.</i>	Major	Oct. 1, 1878	Oct. 1, 1878	Sacramento	Vice Geo. E. Aiken.
E. J. Lewis	Major-General	March 29, 1878	March 29, 1878	Red Bluff	Vice Geo. R. Vernon.
<i>Staff.</i>					
John J. Tobin, Assistant Adjutant-General Henry Edgerton, Engineer Officer Frank J. Skelly, Ordnance Officer William Hawkins, Quartermaster	Lieutenant-Colonel Lieutenant-Colonel Lieutenant-Colonel Lieutenant-Colonel	March 29, 1878 March 29, 1878 Aug. 1, 1877 Feb. 6, 1879	April 6, 1878 April 6, 1878 Sept. 10, 1877 Feb. 12, 1879	San Francisco Sacramento San Francisco Sacramento	Vice Sam'l D. Mayer. Vice A. W. Von Schmidt. Vice C. L. Weller. Vice M. D. Boruck.

TABLE G—Continued.

NAME.	Grade	Date of Rank.	Date of Commission.	Residence.	Remarks.
A. Andrews, Commissary.	Lieutenant-Colonel	March 29, 1878	April 6, 1878	San Francisco	Vice M. L. McDonald.
C. M. Gilmore, Inspector of Rifle Practice.	Lieutenant-Colonel	June 21, 1878	July 2, 1878	San Francisco	Vice Sam'l E. Beaver.
P. W. Black, Division Inspector.	Lieutenant-Colonel	Jan. 21, 1876	April 19, 1876	San Francisco	-----
John C. Murphy, Paymaster.	Lieutenant-Colonel	March 29, 1878	April 6, 1878	San Francisco	Vice John J. Tobin.
Charles A. Garier, Judge Advocate.	Lieutenant-Colonel	Feb. 6, 1879	Feb. 12, 1879	Red Bluff	Vice Wm. M. Pierson.
C. K. Breeze, Surgeon.	Lieutenant-Colonel	Jan. 21, 1876	April 19, 1876	San Francisco	-----
<i>Aids-de-Camp.</i>					
J. M. Sullivan.	Major	June 15, 1878	July 2, 1878	San Francisco	Vice Chas. A. Grow.
William M. Gilson	Major	March 29, 1878	April 6, 1878	Stockton	Vice George L. Reynolds.
<i>FIRST BRIGADE, N. G. C.</i>					
P. W. Murphy	Brigadier-General	April 20, 1878	April 20, 1878	San Luis Obispo	Vice E. M. Sanford.
<i>Staff.</i>					
P. A. Forrester, Assistant Adjutant-General.	Major	July 26, 1878	Aug. 12, 1878	San Luis Obispo	Vice H. M. Smith.
Robert R. Harris, Engineer Officer	Major	July 26, 1878	Aug. 12, 1878	San Luis Obispo	Vice Frank Lecoeuvreur.
Clarence Gray, Ordnance Officer	Major	July 26, 1878	Aug. 12, 1878	Santa Barbara	Vice N. A. Covarrubias.
Samuel A. Pollard, Paymaster	Major	April 12, 1879	May 9, 1879	San Luis Obispo	Vice Lazare Lapdaker.
E. B. Morris, Quartermaster	Major	July 26, 1878	Aug. 12, 1878	San Luis Obispo	Vice Frank Gamahl.
P. H. Dunn, Commissary	Major	July 26, 1878	Aug. 12, 1878	Paso De Robles	Vice A. J. Johnston.
W. L. Stephens, Brigade Inspector	Major	July 26, 1878	Aug. 12, 1878	San Luis Obispo	Vice John F. Godfrey.
William Graves, Judge Advocate	Major	July 26, 1878	Aug. 12, 1878	San Luis Obispo	Vice Henry M. Willis.
W. P. Dillard, Inspector of Rifle Practice	Major	July 26, 1878	Aug. 12, 1878	San Luis Obispo	-----
W. W. Hays, Surgeon	Major	July 26, 1878	Aug. 12, 1878	San Luis Obispo	Vice H. S. Orme.
John H. Hollister, Aid-de-Camp	Captain	July 26, 1878	Aug. 12, 1878	San Luis Obispo	Vice Frank Guirado.
<i>Los Angeles Guard.</i>					
P. M. Dary	Captain.	Jan. 3, 1877	Feb. 3, 1877	Los Angeles	1st re-election Jan. 17, 1879.
William R. Stephenson	1st Lieutenant	June 4, 1879	July 14, 1879	Los Angeles	Vice James Gorman.
Francis H. Steel	2d Lieutenant	June 4, 1879	July 14, 1879	Los Angeles	Vice W. R. Stephenson.
<i>SECOND BRIGADE, N. G. C.</i>					
John McComb	Brigadier-General	Nov. 23, 1875	May 21, 1878	San Francisco	-----
<i>Staff.</i>					
S. W. Backus, Assistant Adjutant-General	Major	Jan. 5, 1875	May 21, 1878	San Francisco	-----

TABLE G—Continued.

NAME.	Grade.	Date of Rank.	Date of Commission.	Residence.	Remarks.
<i>Oakland Light Cavalry, unattached.</i>					
William C. Little	Captain	Sept. 23, 1878	Oct. 5, 1878	Oakland	
T. H. Allen	1st Lieutenant	Sept. 23, 1878	Oct. 5, 1878	Oakland	
B. A. Osborne	Senior 2d Lieutenant	Sept. 23, 1878	Oct. 5, 1878	Oakland	
<i>First California Guard, Light Battery.</i>					
R. G. Brush	Captain	Jan. 6, 1873	Jan. 22, 1873	San Francisco	3d re-election June 9, 1879.
Grand Lapham	Senior 1st Lieutenant	June 9, 1879	June 25, 1879	San Francisco	Vice Geo. W. Chapin.
Allen Knight	Junior 1st Lieutenant	June 9, 1879	June 25, 1879	San Francisco	Vice H. R. Hart.
George W. Dutton	Senior 2d Lieutenant	June 9, 1879	June 25, 1879	San Francisco	Vice J. B. Weller, Jr.
J. H. Jones	Junior 2d Lieutenant	April 17, 1877	April 21, 1877	San Francisco	1st re-election June 9, 1879.
<i>Union Guard, Company "A," Gatling Battery.</i>					
Alfred J. Fritz	Captain	Jan. 18, 1876	Jan. 29, 1876	San Francisco	
Peter B. Quinlan	1st Lieutenant	Sept. 19, 1876	Oct. 6, 1876	San Francisco	1st re-election Feb. 5, 1878.
Michael J. McDermott	Junior 1st Lieutenant	July 1, 1878	July 2, 1878	San Francisco	1st re-election Oct. 15, 1878.
Samuel D. Simmons	2d Lieutenant	July 1, 1878	July 2, 1878	San Francisco	
William Cronan	Junior 2d Lieutenant	July 1, 1878	July 2, 1878	San Francisco	
<i>FIRST INFANTRY REGIMENT.</i>					
<i>Field and Staff.</i>					
Oscar Woodhams	Colonel	Dec. 1, 1877	Dec. 6, 1877	San Francisco	Vice Geo. W. Granniss.
David Wilder	Lieutenant-Colonel	Dec. 1, 1877	Dec. 6, 1877	San Francisco	Vice Oscar Woodhams.
James E. Hughes	Major	Dec. 1, 1877	Dec. 6, 1877	San Francisco	Vice David Wilder.
James L. Fields	1st Lieut. and Adjutant	Nov. 23, 1877	April 6, 1878	San Francisco	Vice self.
A. M. Wilder	1st Lieut. and Quartermaster	Feb. 11, 1879	March 6, 1879	San Francisco	Vice Sidney M. Smith.
William J. Younger	1st Lieut. and Commissary	Jan. 23, 1878	April 6, 1878	San Francisco	Vice Sidney M. Smith.
James Kip	1st Lieut. and Paymaster	Dec. 13, 1876	Dec. 18, 1876	San Francisco	
	1st Lieut. and Inspector Rifle Practice				
Henry Gibbons, Jr.	1st Lieut. and Surgeon	Jan. 23, 1878	April 6, 1878	San Francisco	Vice James D. Whitney.
A. L. Stone	Chaplain	Sept. 10, 1878	Sept. 28, 1878	San Francisco	Vice John Hemphill.

City Guard, Company "B."

John H. Dickenson
Edwin F. Selbeck
Henry A. Plate

National Guard, Company "C."

Herman S. Templeton
Charles P. LeBreton
Charles G. Lidstrom

Franklin Light Infantry, Company "D."

S. F. Wentworth
Vincent Kingwell
George D. Harvey

Sumner Light Guard, Company "E."

Henry J. Burns
W. S. Charleston

Light Guard, Company "F."

George M. Gaylord
George W. Reed

Hewston Rifles, Company "H."

Hynan P. Bush
James Wm. Bates
Charles T. Wilson

SECOND INFANTRY REGIMENT.

Field and Staff.

William R. Smedberg
Henry H. Thrall
Frederick W. Peirce
William Newman
Harry T. Hammond
James W. Staples
Charles E. Jenkins

Captain.	April 5, 1877.	April 19, 1877.	San Francisco	1st re-election April 5, 1879.
1st Lieutenant.	April 5, 1877.	April 19, 1877.	San Francisco	1st re-election April 5, 1879.
2d Lieutenant.	April 5, 1879.	May 9, 1879.	San Francisco	Vice L. R. Townsend.
Captain.	Jan. 6, 1879.	Jan. 22, 1879.	San Francisco	Vice John Stuart.
1st Lieutenant.	Jan. 6, 1879.	Jan. 22, 1879.	San Francisco	Vice H. S. Templeton.
2d Lieutenant.	Jan. 6, 1879.	Feb. 7, 1879.	San Francisco	Vice C. P. LeBreton.
Captain.	June 11, 1879.	July 25, 1879.	San Francisco	Vice Eugene A. Allen.
1st Lieutenant.	June 11, 1879.	July 25, 1879.	San Francisco	Vice S. F. Wentworth.
2d Lieutenant.	June 11, 1879.	July 25, 1879.	San Francisco	Vice Vincent Kingwell.
Captain.	Oct. 23, 1871.	Nov. 1, 1871.	San Francisco	3d re-election Nov. 5, 1877.
1st Lieutenant.	July 7, 1879.	July 25, 1879.	San Francisco	Vice Wm. F. Murray.
2d Lieutenant.	July 7, 1879.	July 25, 1879.	San Francisco	Vice Wm. F. Murray.
Captain.	April 1, 1879.	April 10, 1879.	San Francisco	Vice Martin Jones.
1st Lieutenant.	April 1, 1879.	April 10, 1879.	San Francisco	Vice Wm. H. McClintock.
2d Lieutenant.	April 1, 1879.	April 10, 1879.	San Francisco	Vice Wm. H. McClintock.
Captain.	April 12, 1872.	April 22, 1872.	San Francisco	3d re-election April 18, 1878.
1st Lieutenant.	March 14, 1878.	April 6, 1878.	San Francisco	Vice Charles Janson.
2d Lieutenant.	Jan. 24, 1878.	March 9, 1878.	San Francisco	Vice W. M. Willey.
Colonel.	Oct. 13, 1876.	Oct. 16, 1876.	San Francisco	
Lieutenant-Colonel.	Feb. 15, 1876.	April 14, 1876.	San Francisco	
Major.	June 27, 1878.	July 26, 1878.	San Francisco	Vice Jas. A. Laven.
1st Lieut. and Adjutant.	Feb. 13, 1879.	April 10, 1879.	San Francisco	Vice H. W. Bruhus.
1st Lieut. and Quartermaster.	Dec. 16, 1878.	Dec. 30, 1878.	San Francisco	Vice Hermann Schadtler.
1st Lieut. and Commissary.	April 3, 1878.	May 21, 1878.	San Francisco	Vice Thos. S. Taylor.
1st Lieut. and Paymaster.	March 30, 1878.	May 21, 1878.	San Francisco	
1st Lieut. and Inspector of Rifle Practice.	March 30, 1878.	May 21, 1878.	San Francisco	

TABLE G—Continued.

NAME.	Grade.	Date of Rank.	Date of Commission.	Residence.	Remarks.
Edwin J. Fraser.	1st Lieut. and Surgeon	July 30, 1874.	June 24, 1875.	San Francisco.	
Alfred Todhunter.	Chaplain.	May 21, 1878.	June 13, 1878.	San Francisco.	
———, Company "B."					
Hermann Seeladher.	Captain.	July 29, 1878.	Aug. 12, 1878.	San Francisco.	
Wm. H. Bigger.	1st Lieutenant.	March 22, 1878.	April 6, 1878.	San Francisco.	Vice F. W. Peirce.
Wm. Weldon.	2d Lieutenant.	March 22, 1878.	April 6, 1878.	San Francisco.	
San Francisco Fusiliers, Company "C."					
Ludwig Siebe.	Captain.	Jan. 8, 1877.	Jan. 17, 1877.	San Francisco.	1st re-election Jan. 6, 1879.
David Schoenfeld.	1st Lieutenant.	April 7, 1879.	May 9, 1879.	San Francisco.	Vice Peter Woelber.
Hermann Woelber.	2d Lieutenant.	April 7, 1879.	May 9, 1879.	San Francisco.	Vice Peter Woelber.
Germania Rifles, Company "D."					
William H. Brockhoff.	Captain.	Feb. 13, 1877.	Feb. 20, 1877.	San Francisco.	1st re-election Feb. 19, 1879.
Philip Neuman.	1st Lieutenant.	Feb. 19, 1879.	March 22, 1879.	San Francisco.	Vice T. P. A. Obermeyer.
William Schultz.	2d Lieutenant.	Feb. 19, 1879.	March 22, 1879.	San Francisco.	Vice Wm. Neuman.
———, Company "E."					
Francis W. Bacon.	Captain.	April 3, 1878.	April 29, 1878.	San Francisco.	
Thomas S. Taylor.	1st Lieutenant.	June 25, 1878.	Aug. 12, 1878.	San Francisco.	
Wm. Boley Burtis.	2d Lieutenant.	April 3, 1878.	May 21, 1878.	San Francisco.	
———, Company "G."					
William H. Chamberlain.	Captain.	Oct. 31, 1878.	Nov. 16, 1878.	San Francisco.	Vice Wm. P. Edwards.
Lee W. Mix.	1st Lieutenant.	July 2, 1879.	July 25, 1879.	San Francisco.	Vice Wm. H. Chamberlain.
San Francisco Cadets, Company "H."					
George Bigley.	Captain.	Dec. 30, 1874.	Jan. 7, 1875.	San Francisco.	2d re-election Jan. 10, 1879.
William D. Waters.	1st Lieutenant.	June 27, 1879.	July 23, 1879.	San Francisco.	Vice Ansel C. Robison.
James Radford.	2d Lieutenant.	Dec. 28, 1877.	Jan. 8, 1878.	San Francisco.	Vice B. F. Jones.
THIRD INFANTRY REGIMENT.					
Fidd and Staff.					
Archibald Wason.	Colonel.	March 11, 1871.	March 15, 1871.	San Francisco.	2d re-election Mar. 15, 1879.

Charles Quinn	Lieutenant-Colonel	March 15, 1879	April 5, 1879	San Francisco	Vice M. C. Bateman.
John J. Conlin	Major	March 11, 1871	March 15, 1871	San Francisco	2d re-election Mar. 15, 1879.
Patrick J. Tannian	1st Lieut. and Adjutant	May 1, 1871	May 1, 1871	San Francisco	
John Grant	1st Lieut. and Quartermaster	March 9, 1876	April 19, 1876	San Francisco	
Joseph W. Wallace	1st Lieut. and Commissary	Nov. 5, 1877	Jan. 8, 1878	San Francisco	Vice James G. Maguire.
John T. McKeoghagan	1st Lieut. and Paymaster	Dec. 28, 1874	Jan. 16, 1875	San Francisco	
Joseph W. Maher	1st Lieut. and Inspector of Rifle Practice				
Thomas Green	1st Lieut. and Surgeon	March 30, 1878	April 20, 1878	San Francisco	
Thomas Larkin	Chaplain	May 1, 1871	May 1, 1871	San Francisco	
		May 1, 1871	Jan. 19, 1874	San Francisco	
<i>Montgomery Guard, Company "A."</i>					
John F. Meagher	Captain	May 2, 1879	May 28, 1879	San Francisco	Vice Charles Quinn.
John McNulty	1st Lieutenant	Feb. 3, 1874	Feb. 12, 1874	San Francisco	2d re-election Feb. 12, 1878.
James Prior	2d Lieutenant	May 12, 1874	May 15, 1874	San Francisco	2d re-election May 28, 1878.
<i>Shields Guard, Company "B."</i>					
Henry P. Pilgate	Captain	Jan. 9, 1879	Jan. 22, 1879	San Francisco	Vice M. J. Wrin.
John Blake	1st Lieutenant	Jan. 9, 1879	Feb. 7, 1879	San Francisco	Vice Joseph Monaghan.
Peter McCann	2d Lieutenant	Jan. 9, 1879	Feb. 7, 1879	San Francisco	Vice Patrick McAleer.
<i>Wolfe Tone Guard, Company "C."</i>					
Timothy Fitzpatrick	Captain	Sept. 21, 1875	Oct. 11, 1875	San Francisco	1st re-election Oct. 9, 1877.
M. W. Stackpool	1st Lieutenant	Feb. 3, 1879	March 6, 1879	San Francisco	Vice P. H. Desmond.
H. F. Gittings	2d Lieutenant	Feb. 3, 1879	March 6, 1879	San Francisco	Vice Patrick Murphy.
<i>Meagher Guard, Company "D."</i>					
Daniel J. Sullivan	Captain	May 3, 1876	May 13, 1876	San Francisco	1st re-election May 8, 1878.
Timothy Lowmy	1st Lieutenant	May 8, 1878	Aug. 12, 1878	San Francisco	Vice Timothy Sullivan.
Timothy Sullivan	2d Lieutenant	Feb. 27, 1879	May 9, 1879	San Francisco	Vice James G. Maguire.
<i>Ennet Guard, Company "E."</i>					
Robert Cleary	Captain	May 15, 1868	May 20, 1870	San Francisco	5th re-election May 30, 1878.
Matthew Conlon	1st Lieutenant	April 26, 1877	May 15, 1877	San Francisco	
Richard Stokes	2d Lieutenant	April 26, 1877	May 15, 1877	San Francisco	
<i>McMahon Guard, Company "H."</i>					
John H. McMenomy	Captain	March 11, 1875	March 31, 1875	San Francisco	3d re-election Mar. 24, 1879.
Thomas McNamara	1st Lieutenant	Feb. 4, 1878	Feb. 16, 1878	San Francisco	Vice John H. Gilmore.
Martin Lacy	2d Lieutenant	Feb. 4, 1878	Feb. 16, 1878	San Francisco	Vice Thomas McNamara.

TABLE G—Continued.

NAME.	Grade.	Date of Rank.	Date of Commission.	Residence.	Remarks.
UNATTACHED COMPANIES, 2d BRIGADE, N. G. C.					
<i>Hewston Guard.</i>					
James Armstrong	Captain	June 29, 1869	July 6, 1871	Petaluma	5th re-election June 27, 1879.
Albert G. Twist	1st Lieutenant	June 27, 1879	July 25, 1879	Petaluma	Vice Frank Warren.
William Ordway	2d Lieutenant	June 29, 1877	July 11, 1877	Petaluma	
<i>Oakland Guard.</i>					
Horace D. Ranlett	Captain	May 1, 1873	May 6, 1873	Oakland	2d re-election Jan. 10, 1878.
J. A. C. McDonald	1st Lieutenant	April 24, 1879	May 9, 1879	Oakland	Vice J. B. O. Sarpy.
Henry Levy	2d Lieutenant	April 24, 1879	May 9, 1879	Oakland	Vice J. A. C. McDonald.
<i>Vallejo Rifles.</i>					
Frank O'Grady	Captain	May 5, 1874	May 9, 1874	Vallejo	2d re-election May 14, 1878.
Thomas P. McDonald	1st Lieutenant	April 11, 1877	May 15, 1877	Vallejo	
William McDermott	2d Lieutenant	April 11, 1877	May 15, 1877	Vallejo	
<i>San José Zouaves.</i>					
W. T. Adel	Captain	Feb. 7, 1878	Feb. 16, 1878	San José	Vice James Mulvrenna.
John Hartzoke	1st Lieutenant	May 10, 1877	May 26, 1877	San José	1st re-election June 5, 1879.
Alex. Miller, Jr.	2d Lieutenant	May 10, 1877	May 26, 1877	San José	
<i>Third BRIGADE, N. G. C.</i>					
Edward Canavan	Brigadier-General	April 3, 1876	April 4, 1876	Stockton	
<i>Staff.</i>					
—, Assistant Adjutant-General	Major	Dec. 9, 1878	Dec. 11, 1878	Stockton	Vice David F. Hadley.
Joseph C. Campbell, Engineer Officer	Major	Dec. 9, 1878	Dec. 11, 1878	Bantas	Vice J. P. Kaffiz.
John C. O'Brien, Ordnance Officer	Major	April 3, 1877	April 19, 1877	Stockton	
Emanuel Block, Quartermaster	Major	Nov. 11, 1878	Nov. 16, 1878		Vice Joseph Dyas.
Moses C. Andrews, Commissary	Major	June 27, 1876	June 30, 1876	Collegeville	
James M. Garwood, Paymaster	Major	May 29, 1875	June 2, 1875	Stockton	
R. P. Nason, Brigade Inspector	Major	June 27, 1876	June 30, 1876	Lathrop	
James A. Shepherd, Judge Advocate	Major	May 2, 1878	May 3, 1878	Stockton	
Morgan Dillon Baker, Inspector of Rifle Practice	Major	Aug. 15, 1877	Aug. 18, 1877	Modesto	Vice E. A. Stockton.
Mathew Hines Hall, Surgeon	Major				

Charles W. Dohrmann, Aid-de-Camp----- <i>Stockton Guard.</i>	Captain-----	Dec. 9, 1878-----	Dec. 11, 1878-----	Stockton-----	Vice John C. O'Brien-----
Eugene Lele-----	Captain-----	Oct. 16, 1876-----	Oct. 24, 1876-----	Stockton-----	1st re-election Oct. 18, 1878.
John J. Numan-----	1st Lieutenant-----	April 20, 1876-----	May 4, 1876-----	Stockton-----	1st re-election April 19, 1878.
John W. Payne-----	2d Lieutenant-----	April 20, 1876-----	May 4, 1876-----	Stockton-----	1st re-election April 19, 1878.
FOURTH BRIGADE, N. G. C.					
Thomas J. Clunie----- <i>Staff.</i>	Brigadier-General-----	Dec. 30, 1878-----	Dec. 30, 1878-----	Sacramento-----	Vice M. S. Horan-----
W. A. Anderson, Astd. Adjutant-General-----	Major-----	Nov. 30, 1875-----	Dec. 1, 1875-----	Sacramento-----	
D. E. Alexander, Engineer Officer-----	Major-----	March 7, 1877-----	March 22, 1877-----	Sacramento-----	
N. L. Drew, Ordnance Officer-----	Major-----	Jan. 2, 1879-----	Jan. 15, 1879-----	Sacramento-----	Vice Wm. Bartels.
R. H. Pettit, Quartermaster-----	Major-----	Jan. 2, 1879-----	Jan. 15, 1879-----	Sacramento-----	Vice John Egan.
A. J. Wetzel, Commissary-----	Major-----	Jan. 30, 1877-----	Feb. 3, 1877-----	Sacramento-----	
William A. Beck, Paymaster-----	Major-----	June 27, 1877-----	June 28, 1877-----	Sacramento-----	
K. F. Wiemeyer, Brigade Inspector-----	Major-----	Jan. 2, 1879-----	Jan. 15, 1879-----	Sacramento-----	Vice Creed Haymond.
Matt. F. Johnson, Judge Advocate-----	Major-----	March 7, 1877-----	March 22, 1877-----	Sacramento-----	
W. I. Wallace, Inspector of Rifle Practice-----	Major-----	May 1, 1878-----	May 3, 1878-----	Sacramento-----	
G. G. Tyrrell, Surgeon-----	Major-----	Nov. 30, 1875-----	Dec. 1, 1875-----	Sacramento-----	
John McFettrish, Aid-de-Camp-----	Captain-----	Jan. 2, 1879-----	Jan. 15, 1879-----	Sacramento-----	
FIRST BATTALION OF INFANTRY.					
<i>Field and Staff.</i>					
Creed Haymond-----	Lieutenant-Colonel-----	Jan. 22, 1879-----	Feb. 12, 1879-----	Sacramento-----	
Clinton L. White-----	Major-----	Jan. 22, 1879-----	Feb. 12, 1879-----	Sacramento-----	
John W. Guthrie-----	1st Lieut. and Adjutant-----	Feb. 13, 1879-----	March 6, 1879-----	Sacramento-----	
D. J. Simmons-----	1st Lieut. and Quartermaster-----	Feb. 13, 1879-----	March 6, 1879-----	Sacramento-----	
W. E. Chesley-----	1st Lieut. and Commissary-----	Feb. 13, 1879-----	March 6, 1879-----	Sacramento-----	
Otto Reifarth-----	1st Lieut. and Paymaster of-----	Feb. 13, 1879-----	March 6, 1879-----	Sacramento-----	
John T. Carey-----	Rifle Practice-----	Feb. 13, 1879-----	March 6, 1879-----	Sacramento-----	
George A. White----- <i>City Guard, Company "A."</i>	1st Lieut. and Surgeon-----	Feb. 13, 1879-----	March 6, 1879-----	Sacramento-----	
Frederick J. Kearney-----	Captain-----	Sept. 5, 1878-----	Sept. 12, 1878-----	Sacramento-----	Vice J. W. Guthrie.
Edward H. McKee-----	1st Lieutenant-----	July 1, 1875-----	April 19, 1876-----	Sacramento-----	1st re-election Oct. 4, 1877.
Thomas W. Younger-----	2d Lieutenant-----	Sept. 5, 1878-----	Sept. 12, 1878-----	Sacramento-----	Vice F. J. Kearney.
<i>Nevada Light Guard, Company "C."</i>					
John A. Rapp-----	Captain-----	Nov. 11, 1873-----	Jan. 10, 1874-----	Nevada City-----	2d re-election Nov. 28, 1877.

TABLE G.—Continued.

NAME.	Grade.	Date of Rank.	Date of Commission.	Residence.	Remarks.
Wm. J. Organ.	1st Lieutenant	Dec. 6, 1875	Dec. 8, 1875	Nevada City	1st re-election Nov. 28, 1877.
James S. Murchie	2d Lieutenant	Dec. 6, 1875	Dec. 8, 1875	Nevada City	1st re-election Nov. 28, 1877.
<i>Placerville City Guard, Company "D."</i>					
J. E. Dean	Captain	Jan. 28, 1879	Feb. 10, 1879	Placerville	Vice G. F. McDonald.
A. W. Marces	1st Lieutenant	Jan. 28, 1879	Feb. 10, 1879	Placerville	Vice P. Vignat.
N. Dunn	2d Lieutenant	Jan. 28, 1879	Feb. 10, 1879	Placerville	Vice A. W. Marces.
<i>Yuba Light Infantry Company "E."</i>					
Josiah P. Brown	Captain	Nov. 7, 1863	Jan. 20, 1871	Camptonville	8th re-election Jan. 11, 1879.
John G. McLellan	1st Lieutenant	Jan. 9, 1875	Jan. 16, 1875	Camptonville	2d re-election Jan. 11, 1879.
Joseph H. Fuller	2d Lieutenant	Jan. 9, 1875	Jan. 16, 1875	Camptonville	2d re-election Jan. 11, 1879.
<i>Sorsfield Guard, Company "G."</i>					
T. W. Sheehan	Captain	Jan. 24, 1879	Feb. 7, 1879	Sacramento	Vice C. A. Laufkotter.
J. P. Dalton	1st Lieutenant	Feb. 6, 1878	Feb. 16, 1878	Sacramento	Vice B. M. Van Alstein.
Fred. Neary	2d Lieutenant	Feb. 6, 1878	Feb. 16, 1878	Sacramento	Vice J. P. Dalton.
<i>Sacramento Light Artillery.</i>					
George H. Francis	Captain	Feb. 11, 1878	Feb. 16, 1878	Sacramento	Vice A. C. York.
Eugene Kueneman	Senior 1st Lieutenant	Dec. 28, 1877	Jan. 30, 1878	Sacramento	Vice J. F. McDorman.
James F. Lucas	Senior 2d Lieutenant	Dec. 28, 1877	Jan. 30, 1878	Sacramento	Vice E. Kueneman.
William J. Cooper	Junior 2d Lieutenant	Aug. 16, 1878	Aug. 22, 1878	Sacramento	Vice C. W. Metcalf.
<i>Fifth Brigade, N. G. C.</i>					
Charles Cadwalader	Brigadier-General	April 1, 1875	April 6, 1877	Red Bluff	Vice self reappointed.
<i>Staff.</i>					
Chas. T. Alford, Assistant Adjutant-General.	Major	Aug. 10, 1878	Aug. 12, 1878	Red Bluff	Vice L. S. Welton.
Charles Faulkner, Engineer Officer.	Major	April 21, 1876	May 4, 1876	Chico	
Joseph S. Conc, Ordnance Officer.	Major	Oct. 10, 1876	Oct. 24, 1876	Red Bluff	
James W. B. Montgomery, Quartermaster.	Major	Nov. 24, 1877	Nov. 28, 1877	Cana	Vice A. M. Bailey.
Joseph R. Houghton, Commissary.	Major	June 9, 1876	June 26, 1876	Nord	
John A. Turner, Paymaster.	Major	June 30, 1873	July 9, 1873	Chico	
Gorham G. Kimball, Brigade Inspector.	Major	March 2, 1876	May 6, 1876	Red Bluff	
Patrick O. Hundley, Judge Advocate.	Major	April 24, 1878	April 29, 1878	Oroville	Vice E. J. Lewis.

John Brady, Inspector of Rifle Practice	Major	Aug. 12, 1878	Red Bluff	
James S. Cameron, Surgeon	Major	April 14, 1876	Red Bluff	
Thomas R. Ryan, Aid-de-Camp	Captain	July 13, 1874	Red Bluff	
<i>Chico Guard.</i>				
William T. Turner	Captain	April 30, 1875	Chico	2d re-election April 30, 1879.
Hiram F. Batchelder	1st Lieutenant	April 30, 1875	Chico	2d re-election April 30, 1879.
Wm. R. Williams	2d Lieutenant	Aug. 30, 1878	Chico	Vice John M. Pearson.
SIXTH BATTALION, N. G. C.				
J. G. Wall	Brigadier-General	Feb. 18, 1876	Crescent City	
<i>Staff.</i>				
Jacob Marhofer, Ass't. Adjutant-General	Major	April 19, 1876	Crescent City	
L. F. Cooper, Engineer Officer	Major	April 19, 1876	Crescent City	
Pierce H. Ryan, Ordnance Officer	Major	April 19, 1876	Eureka	
George W. Tuck, Paymaster	Major	April 19, 1876	Crescent City	
J. E. Murphy, Quartermaster	Major	April 19, 1876	Crescent City	
M. B. Adams, Commissary	Major	April 19, 1876	Arcata	
George B. Temple, Brigade Inspector	Major	April 19, 1876	Happy Camp	
Edgar Mason, Judge Advocate	Major	April 19, 1876	Crescent City	
Inspector of Rifle Practice	Major	April 26, 1877	Crescent City	
John W. Reins, Surgeon	Major	April 19, 1876	Smith River	
George E. Tryon, Aid-de-Camp	Captain	May 4, 1876		
<i>Eureka Guards.</i>				
Alexander Campbell	Captain	March 15, 1879	Eureka	
James B. Brown	1st Lieutenant	March 15, 1879	Eureka	
William P. Hanna	2d Lieutenant	March 15, 1879	Eureka	

TABLE H.

Retired List of Commissioned Officers, N. G. C.

NAME.	Rank, etc., held at date of application to be placed upon Retired List.	Date of Application.	Date of Retirement.	Remarks.
Bateman, M. C. -----	Lieutenant-Colonel, Third Infantry Regiment, Second Brigade, N. G. C.-----	April 1, 1879.-----	April 4, 1879.-----	Retired with rank of Lieutenant-Colonel. Per S. O. No. 12, C. S. 1879.-----
Chapin, Geo. W.-----	Senior 1st Lieutenant, First California Guard, unattached, Second Brigade, N. G. C.-----	June 20, 1879.-----	June 24, 1879.-----	Retired with rank of First Lieutenant. Per S. O. No. 20, C. S. 1879.-----

TABLE I.

A list of exempt certificates issued from August 1st, 1877, to August 1st, 1879.

NAME.	Rank.	Company.	Company Letter.	Regiment or Battalion.	Brigade	Date of Certificate.
Blair, Mathew.	Late Private	Placerville City Guard	"D"	First	Fourth.	June 6, 1878.
Butler, Joseph J.	Late 1st Lieutenant	Light Guard	"F"	First	Second	August 3, 1878.
Brockhoff, Wm. H.	Captain	Germania Rifles	"D"	Second	Second	August 3, 1878.
Burkline, Henry	Private	Germania Rifles	"D"	Second	Second	August 3, 1878.
Brown, Alonso F.	Late Private	National Guard	"C"	First	Fourth.	September 14, 1878.
Burke, Dennis	Private	Sarsfield Guard	"C"	First	Fourth.	September 24, 1878.
Bailey, Orrin	Corporal	Franklin Light Infantry	"D"	First	Second	November 9, 1878.
Bruce, August	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Behrens, D.	Corporal	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Bend, W.	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Bauer, Hermann	Sergeant	Stockton Guard, unattached	"C"	Second	Third	December 12, 1878.
Brickwedel, Chas. H., Jr.	Private	National Guard	"C"	First	Second	December 18, 1878.
Brubins, H. W.	1st Lieutenant and Quartermaster	First Light Dragoons	"A"	First	Second	December 31, 1878.
Back, J. A.	Private	National Guard	"C"	First	Second	February 12, 1879.
Burkham, James W.	Late Private	Germania Rifles	"D"	First	Second	February 18, 1879.
Brockhoff, Charles H.	Private	Germania Rifles	"D"	First	Second	February 18, 1879.
Blake, John	Sergeant	First Light Dragoons	"A"	First	Second	February 18, 1879.
Bigley, George	Captain	San Francisco Cadets	"H"	Second	Second	March 22, 1879.
Coffey, Thomas B.	Sergeant	Montgomery Guard	"A"	Third	Second	April 23, 1879.
Collner, William	Sergeant	Late Stockton Guard	"E"	Second	Second	October 18, 1877.
Geell, John	Private	Summer Light Guard	"E"	First	Second	May 13, 1878.
Camp, William	Private	Germania Rifles	"D"	Second	Second	July 9, 1878.
Colvin, James A.	Private	Union Guard, Company "A," Gatling Battery	"D"	Second	Second	August 3, 1878.
Crum, T. T.	Private	Sarsfield Guard	"G"	First	Second	September 6, 1878.
Conlon, Matthew	1st Lieutenant	Emmet Guard	"E"	Third	Fourth	September 21, 1878.
Carscousen, Julius	Private	San Francisco Fusiliers	"C"	Second	Second	November 7, 1878.
Cavis, Joseph W.	Private	Stockton Guard, unattached	"A"	Third	Third	December 7, 1878.
Conway, Bernard	Sergeant	Montgomery Guard	"A"	Third	Second	December 12, 1878.
Cook, M. M.	1st Lieutenant	First Light Dragoons	"A"	First	Second	January 18, 1879.
Croan, William	Junior 2d Lieutenant	Union Guard, Company "A," Gatling Battery	"A"	Second	Second	March 22, 1879.
Cunningham, Wm. E.	Private	San Francisco Cadets	"H"	Second	Second	April 23, 1879.
						May 9, 1879.

TABLE I—Continued.

NAME.	Rank.	Company.	Company Letter.	Regiment or Battalion.	Brigade.	Date of Certificate.
Connor, John	Private	Meagher Guard	"D"	Third	Second	May 27, 1879.
Corcoran, William	1st Lieutenant and Quartermaster	First Cavalry Battalion			Second	June 19, 1879.
Dimmick, John	Late Corporal	National Guard	"C"	First	Second	April 17, 1878.
Doddard, John	Corporal	Meagher Guard	"D"	Third	Second	July 3, 1878.
Devaney, John	Late Private	Montgomery Guard	"C"	Third	Second	November 14, 1878.
Dunker, Dietrich	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Douglass, John B.	Sergeant	Stockton Guard, unattached		Third	Third	December 12, 1878.
Downs, Charles	Private	Montgomery Guard	"A"	Third	Second	February 12, 1879.
Dillon, Bernard F.	Private	McMahon Guard	"H"	Third	Second	May 29, 1879.
Daly, John B.	Late Private	National Guard	"C"	First	Second	July 26, 1879.
Ewald, Anton	Private	Steuben Guard	"E"	Second	Second	December 21, 1877.
Enright, E. P.	Late Sergeant	Montgomery Guard	"A"	Third	Second	June 19, 1879.
Engelberg, Emil	Private	Germania Rifles	"D"	Second	Second	July 26, 1879.
Fenckhausen, A.	Private	Germania Rifles	"D"	Second	Second	August 3, 1878.
Fritz, Alfred J.	Captain	Union Guard, Company "A," Gatling Battery			Second	August 28, 1878.
Fuselier, William	Private	Union Guard, Company "A," Gatling Battery			Second	August 28, 1878.
Flinn, Patrick T.	Private	Union Guard, Company "A," Gatling Battery			Second	August 28, 1878.
Fritz, Eugene N.	Private	Union Guard, Company "A," Gatling Battery			Second	August 28, 1878.
Folmer, John	Sergeant	San José Zouaves, unattached	"D"	Second	Second	August 29, 1878.
Fortmann, Henry	Sergeant	Germania Rifles	"E"	Second	Second	April 23, 1879.
Ganzhorn, Christian	Private	Steuben Guard	"E"	Second	Second	September 15, 1877.
Glaser, Peter	Private	Steuben Guard	"E"	Third	Second	November 21, 1877.
Green, Thomas	1st Lieutenant and Assistant Surgeon	Union Guard, Company "A," Gatling Battery			Second	December 21, 1877.
Graham, Robert T.	Private	San Francisco Hussars	"B"	First	Second	August 28, 1878.
Gray, Edward P.	Private	San Francisco Fusiliers	"C"	Second	Second	November 21, 1878.
Goils, Fred	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Goeljen, Charles	Sergeant	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Gundlach, F.	Private	San Francisco Fusiliers	"B"	Third	Second	December 18, 1878.
Gronwey, Terrence	Private	Shields Guard	"A"	Third	Second	December 18, 1878.
Gleeson, John	Private	Montgomery Guard	"C"	Second	Second	December 18, 1878.
Gibb, James	Private	San Francisco Fusiliers	"A"	First	Second	December 22, 1879.
Gray, H. W.	Captain	First Light Dragons	"C"	First	Second	March 22, 1879.
Greeny, P. W.	Private	Jackson Dragons	"C"	First	Second	April 23, 1879.
Glynn, James	Sergeant	Jackson Dragons	"C"	First	Second	July 12, 1879.

Hector, John	Late Private	City Guard	"A"	First	Fourth	November 12, 1877.
Haswell, Edward F.	Late Sergeant	City Guard	"A"	First	Fourth	April 30, 1878.
Hunt, Clarence M.	Late Private	Summer Light Guard	"E"	First	Second	June 13, 1878.
Higgins, John	Private	San Francisco Hussars	"B"	First	Second	July 18, 1878.
Hanser, Conrad	Private	Germania Rifles	"D"	Second	Second	August 14, 1878.
Hanson, Richard C.	Private	Summer Light Guard	"E"	First	Second	August 28, 1878.
Houigan, John L.	Private	Montgomery Guard	"A"	Third	Second	September 6, 1878.
Harvey, George D.	Sergeant	Franklin Light Infantry	"D"	First	Second	October 21, 1878.
Hentz, A. H.	Corporal	National Guard	"C"	First	Second	November 14, 1878.
Hess, Christian	Private	San Francisco Fusiliers	"C"	Second	Third	December 7, 1878.
Hanks, Robert V.	Corporal	Stockton Guard, unattached			Third	December 12, 1878.
Hussey, Arthur	Corporal	Stockton Guard	"C"	First	Second	December 18, 1878.
Heyman, Abe R.	Private	National Guard	"C"	Second	Second	December 18, 1878.
Hink, John F.	Private	San Francisco Fusiliers	"A"	Third	Second	December 18, 1878.
Hoss, John	Private	San Francisco Fusiliers	"A"	First	Second	January 10, 1879.
Harrington, James	Private	Montgomery Guard			Second	March 22, 1879.
Hox, John	2d Lieutenant	First Light Dragoons	"C"	Second	Third	May 27, 1879.
Hersey, Thomas E.	Sergeant	Stockton Guard, unattached	"C"	Second	Second	December 7, 1878.
Hreneyer, Henry	Private	San Francisco Fusiliers	"E"	Third	Second	October 18, 1877.
Jensen, William	Sergeant	Emmet Guard	"E"	Second	Second	April 25, 1878.
Jordan, John	Private	Steuben Guard	"E"	Third	Second	March 22, 1879.
Joy, Wm. J. Blythe	Musician				Second	April 23, 1879.
Jones, Bartlett F.	Late 2d Lieutenant	San Francisco Cadets	"H"	Second	Second	October 8, 1877.
Kron, Julius	Private	Steuben Guard	"E"	Second	Second	November 21, 1877.
Kock, Claus	Private	Steuben Guard	"E"	Second	Second	April 29, 1878.
Katz, Fred	Private	Steuben Guard	"E"	Second	Second	May 23, 1878.
Kutler, William C.	Sergeant	Late Steuben Guard			Fourth	June 6, 1878.
Kueneman, Eugene	Junior 1st Lieutenant	Sacramento Light Artillery, unattached			Fourth	June 6, 1878.
King, Jeremiah B.	Sergeant	Sacramento Light Artillery, unattached			Fourth	August 3, 1878.
Krausgrill, John	Private	Germania Rifles	"D"	Second	Second	October 24, 1878.
Kelly, John G.	Private	Jackson Dragoons	"C"	First	Second	November 25, 1878.
Kellegar, John	Private	Shields Guard	"B"	Third	Second	January 26, 1879.
Killien, Patrick	Private	Montgomery Guard	"A"	Third	Second	June 7, 1879.
Kerr, William	Private	Germania Rifles	"D"	Second	Second	August 15, 1877.
Lyons, Michael	Late Private	Montgomery Guard	"A"	Third	Second	October 8, 1877.
Lindner, Joel	Private	Steuben Guard	"E"	Second	Second	October 30, 1877.
Lauterback, Charles	Private	Steuben Guard	"E"	Second	Second	May 17, 1878.
Laird, D. W.	Major and Ordnance Officer				Second	August 28, 1878.
Lebevallier, Francis	Sergeant	Union Guard, Company "A," Gatling Battery			Second	August 28, 1878.
Langan, Thomas	Private	Union Guard, Company "A," Gatling Battery			Second	October 21, 1878.
Lidstrom, Charles G.	Corporal	National Guard	"C"	First	Third	December 12, 1878.
Lehe, Eugene	Captain	Stockton Guard, unattached			Second	December 18, 1878.
Long, Maurice	Private	Montgomery Guard	"A"	Third		

TABLE I—Continued.

NAME.	Rank.	Company.	Company Letter.	Regiment or Battalion.	Brigade.	Date of Certificate.
Luhns, N. C.	Private	San Francisco Fusiliers	"C"	Second	Second	December 18, 1878.
Lynch, Martin	Private	Shields Guard	"B"	Third	Second	December 18, 1878.
Moran, James F.	Sergeant	Montgomery Guard	"A"	Third	Second	August 15, 1877.
Meyer, Solomon	Private	Howston Rifles	"H"	First	Second	January 2, 1878.
Miller, R. J.	Private	San Francisco Hussars	"B"	First	Second	July 27, 1878.
Meyer, Charles	Private	Germania Rifles	"D"	Second	Second	August 3, 1878.
Moran, Frank James	Sergeant	Summer Light Guard	"E"	First	Second	August 13, 1878.
Merkelback, William	Private	Union Guard, Company "A," Gatling Battery	"A"	First	Second	August 28, 1878.
McIntosh, Patrick F.	1st Lieutenant	Jackson Dragons	"C"	First	Second	August 28, 1878.
McAdams, Thomas	Private	Sarsfield Guard	"G"	First	Fourth	September 24, 1878.
Moore, Robert	Corporal	Union Guard, Company "A," Gatling Battery	"A"	First	Second	October 12, 1878.
Mayers, Alfred	Corporal	National Guard	"C"	First	Second	October 21, 1878.
Mitchell, Patrick	Corporal	Meagher Guard	"D"	Third	Second	October 24, 1878.
McElhinny, P. H.	Late Private	National Guard	"C"	First	Second	November 16, 1878.
McAleer, Patrick	2d Lieutenant	Shields Guard	"B"	Third	Second	November 25, 1878.
McMenomy, J. H.	Captain	McMahon Guard	"H"	Third	Second	November 25, 1878.
McGuire, Francis	Sergeant	Shields Guard	"B"	Third	Second	November 25, 1878.
Mayrissel, Adolph	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Meyer, Henry	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Mayrissel, Gustave	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
McLellan, Edward L.	Private	Stockton Guard, unattached	"C"	Second	Second	December 7, 1878.
McKnight, Peter	Private	McMahon Guard	"H"	Third	Third	December 12, 1878.
Monaghan, Joseph	1st Lieutenant	Shields Guard	"B"	Third	Second	December 18, 1878.
Murphy, Dennis T.	Private	Jackson Dragons	"C"	First	Second	December 18, 1878.
Mullen, Patrick	Private	Montgomery Guard	"A"	Third	Second	December 18, 1878.
McConduy, Fred. W.	Late Private	City Guard	"B"	First	Second	January 20, 1879.
McLoughlin, James	Private	Jackson Dragons	"C"	First	Second	February 8, 1879.
Melbourn, Joseph	Private	San Francisco Hussars	"B"	First	Second	February 12, 1879.
McAnn, Joseph	Private	Meagher Guard	"D"	Third	Second	March 6, 1879.
Maloney, Daniel	Private	Montgomery Guard	"A"	Third	Second	April 4, 1879.
Mallon, Patrick	Private	Jackson Dragons	"C"	First	Second	April 11, 1879.
Moon, Andrew J.	Private	First Light Dragons	"A"	First	Second	April 23, 1879.
McArdle, Peter	Private	Wolfe Tone Guard	"C"	Third	Second	April 30, 1879.
McMillan, James A.	Private	First Light Dragons	"A"	First	Second	May 9, 1879.
						July 10, 1879.

Moulton, E. S.	Private	First Light Dragoons	"A"	First	Second	July 10, 1879.
Newman, Phillip	Corporal	San Francisco Hussars	"B"	First	Second	April 17, 1878.
Newman, William	2d Lieutenant	Germania Rifles	"D"	Second	Second	August 3, 1878.
Newman, Simon	Corporal	San Francisco Hussars	"B"	First	Second	September 28, 1878.
Naber, Henry D.	1st Lieutenant	San Francisco Fusileers	"C"	Second	Second	December 7, 1878.
Nickerson, Louis H.	Late Private	National Guard	"C"	First	Second	January 18, 1879.
Nagle, Richard H.	Private	Montgomery Guard	"A"	Third	Second	July 18, 1879.
O'Neill, Charles	Corporal	Meagher Guard	"D"	Third	Second	August 13, 1878.
O'Neill, Thomas	Private	Shields Guard	"B"	Third	Second	November 23, 1878.
O'Rourke, Peter	Corporal	Montgomery Guard	"A"	Third	Second	January 18, 1879.
O'Meara, Michael	Private	Jackson Dragoons	"C"	First	Second	January 20, 1879.
O'Brien, John	Corporal	Montgomery Guard	"A"	Third	Second	April 11, 1879.
O'Neill, Edward J.	Late Private	Wolfe Tone Guard	"C"	Third	Second	June 30, 1879.
Otto, Charles	Sergeant	San Francisco Hussars	"B"	First	Second	July 18, 1879.
Pearson, John	Private	Placerville City Guard	"D"	First	Fourth	April 5, 1878.
Powell, Jacob	Private	San José Zouaves, unattached			Second	April 20, 1878.
Plate, H. A.	Sergeant	City Guard	"B"	First	Second	August 3, 1878.
Paulsen, Herman	Corporal	San Francisco Fusileers	"C"	Second	Second	December 7, 1878.
Pinkett, Gerald	Sergeant	Wolfe Tone Guard	"C"	Third	Second	February 12, 1879.
Prior, James	2d Lieutenant	Montgomery Guard	"A"	Third	Second	February 18, 1879.
Poppe, D.	Private	San Francisco Fusileers	"C"	Second	Second	March 22, 1879.
Paul, Philip L.	Late Private	Oakland Guard, unattached			Second	June 12, 1879.
Quinn, Charles	Captain	Montgomery Guard	"A"	Third	Second	September 6, 1878.
Ruth, Anthony	2d Lieutenant	Late Steuben Guard	"E"	Second	Second	May 17, 1878.
Ritzrow, Leopold J.	Private	First California Guard, unattached			Second	June 25, 1878.
Robertson, John P.	Private	National Guard	"C"	First	Second	August 28, 1878.
Reavey, Thomas	Sergeant	Ennet Guard	"E"	Third	Second	August 28, 1878.
Roller, Benjamin R.	Sergeant	Light Guard	"F"	First	Second	September 5, 1878.
Ruthrauff, Alonzo T.	Late Private	Summer Light Guard	"E"	First	Second	October 21, 1878.
Reiners, C. A.	Private	San Francisco Fusileers	"C"	Second	Second	December 7, 1878.
Roesler, H. A.	Private	San Francisco Fusileers	"C"	Second	Second	February 4, 1879.
Rotherman, John	Sergeant	First Light Dragoons	"A"	First	Second	February 12, 1879.
Roy, J. A.	Private	First Light Dragoons	"A"	First	Second	March 22, 1879.
Riley, James H.	Sergeant	McMahon Guard	"H"	Third	Second	April 4, 1879.
Robison, Ansel C.	1st Lieutenant	San Francisco Cadets	"H"	Second	Second	April 23, 1879.
Ryan, James W.	Sergeant	Montgomery Guard	"A"	Third	Second	June 6, 1879.
Roy, N. H.	Private	First Light Dragoons	"A"	First	Second	July 12, 1879.
Specht, John	Late Private	Steuben Guard	"E"	Second	Second	October 30, 1877.
Schwarz, Joseph	Sergeant	Steuben Guard	"E"	Second	Second	December 6, 1877.
Schuster, Christian	Private	Steuben Guard	"E"	Second	Second	December 21, 1877.
Sullivan, Jeremiah	Private	Meagher Guard	"D"	Third	Second	August 7, 1878.
Sullivan, Michael	Private	Meagher Guard	"D"	Third	Second	August 28, 1878.
Smith, Sidney M.	1st Lieutenant and Quartermaster			First	Second	August 28, 1878.

TABLE I—Continued.

NAME.	Rank.	Company.	Company Letter.	Regiment or Battalion.	Brigade.	Date of Certificate.
Sullivan, John J.	Private	Mengher Guard	"D"	Third	Second	October 5, 1878.
Sullivan, D. J.	Captain	Mengher Guard	"D"	Third	Second	October 12, 1878.
Small, Archibald	Private	Shields Guard	"B"	Third	Second	November 25, 1878.
Schonfeld, David	Sergeant	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Siebs, Ludwig	Captain	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Siebs, John	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Stange, John D.	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Scott, James	Late Private	City Guard	"A"	First	Fourth	December 7, 1878.
Sullivan, Florence	Sergeant	Mengher Guard	"D"	Third	Second	December 18, 1878.
Sheeran, Nicholas	Sergeant	Jackson Dragons	"C"	First	Second	December 18, 1878.
Schmucker, Andreas	Private	San Francisco Fusiliers	"C"	Second	Second	December 18, 1878.
Simonds, W. S.	Sergeant	First Light Dragons	"A"	First	Second	February 4, 1879.
Sweeney, Nicholas	Private	Montgomery Guard	"A"	Third	Second	February 12, 1879.
Sullivan, Timothy	2d Lieutenant	Mengher Guard	"D"	Third	Second	April 4, 1879.
Tittel, Charles	Private	Steuben Guard	"E"	Second	Second	July 26, 1879.
Tillmar, Augustus	Corporal	San Francisco Hussars	"B"	First	Second	November 21, 1877.
Thierbach, Charles	Private	San Francisco Fusiliers	"C"	Second	Second	September 28, 1878.
Von Glahn, John	Private	San Francisco Fusiliers	"C"	Second	Second	December 7, 1878.
Wagner, William	Private	Steuben Guard	"E"	Second	Second	December 18, 1878.
Wahl, Christian	Private	Steuben Guard	"E"	Second	Second	September 6, 1877.
Wacht, Charles	Captain	Late Steuben Guard	"E"	Second	Second	February 4, 1878.
Wichenhauser, F.	1st Lieutenant	Late Steuben Guard	"E"	Second	Second	April 20, 1878.
Wallace, William I.	Major and Inspector Rifle Practice.					May 13, 1878.
Wallace, Joseph W.	1st Lieutenant and Commissary					October 3, 1878.
Wolber, Peter	1st Lieutenant	San Francisco Fusiliers	"C"	Third	Second	November 14, 1878.
Wolber, Hermann	Sergeant	San Francisco Fusiliers	"C"	Second	Second	March 22, 1879.
Wilbermuth, Julius	Private	San Francisco Fusiliers	"C"	Second	Second	March 22, 1879.
Winter, John H.	Private	San Francisco Fusiliers	"C"	Second	Second	July 8, 1879.
Zimmer, Charles K.	Private	Germania Rifles	"D"	Second	Second	August 3, 1878.

TABLE J.

Resignations and casualties from August 1st, 1877, to August 1st, 1879.

NAME.	Rank, Etc.	Date of Resignation.	Date of Acceptance.	Remarks.
Aiken, George E.	Major and Assistant Adjutant-General on Staff of Adjutant-General, California	Sept. 11, 1878.	Oct. 1, 1878.	Per G. O. No. 9, C. S. 1878.
Allen, Eugene A.	Captain Franklin Light Infantry, Company "D," First Infantry Regiment, Second Brigade, N. G. C.	Mar. 18, 1879.	Mar. 22, 1879.	Per S. O. No. 10, C. S. 1879.
Beaver, Samuel E.	Lieutenant-Colonel and Inspector of Rifle Practice on Staff of Major-General commanding "G," Second Infantry Regiment, Second Brigade, N. G. C.	June 11, 1878.	June 21, 1878.	Per S. O. No. 11, C. S. 1878.
Brittan, N. J.	First Lieutenant Company "G," Second Infantry Regiment, Second Brigade, N. G. C.	Aug. 28, 1878.	Sept. 4, 1878.	Per S. O. No. 18, C. S. 1878.
Boruck, M. D.	Lieutenant-Colonel and Quartermaster on Staff of Major-General commanding "H," Second Infantry Regiment, Second Brigade, N. G. C.	Jan. 13, 1879.	Feb. 6, 1879.	Per S. O. No. 4, C. S. 1879.
Cunningham, William E.	First Lieutenant San Francisco Cadets, Company "H," Second Infantry Regiment, Second Brigade, N. G. C.	Nov. 8, 1877.	Nov. 23, 1877.	Per S. O. No. 26, C. S. 1877.
Cook, A. A.	First Lieutenant San Francisco Cadets, Company "H," Second Infantry Regiment, Second Brigade, N. G. C.	June 6, 1878.	June 13, 1878.	Per S. O. No. 9, C. S. 1878.
Crocker, C. F.	Second Lieutenant Company "G," Second Infantry Regiment, Second Brigade, N. G. C.	Aug. 27, 1878.	Sept. 24, 1878.	Per S. O. No. 19, C. S. 1878.
Dras, J. C.	Major and Commissary on Staff of Brigadier-General commanding Third Brigade, N. G. C.	Oct. 14, 1878.	Oct. 23, 1878.	Per S. O. No. 20, C. S. 1878.
Edwards, William P.	Captain Company "G," Second Infantry Regiment, Second Brigade, N. G. C.	Aug. 27, 1878.	Sept. 24, 1878.	Per S. O. No. 19, C. S. 1878.
Elliot, William G.	First Lieutenant and Adjutant on Staff of Major commanding First Cavalry Battalion, Second Brigade, N. G. C.	Nov. 16, 1878.	Nov. 21, 1878.	Per S. O. No. 22, C. S. 1878.
Emmis, Nicholas	Second Lieutenant Jackson Dragoons, Company "C," First Cavalry Battalion, Second Brigade, N. G. C.	May 1, 1879.	May 9, 1879.	Per S. O. No. 15, C. S. 1879.
Ford, S. P.	First Lieutenant and Adjutant on Staff of Colonel commanding Second Infantry Regiment, Second Brigade, N. G. C.	Aug. 3, 1877.	Aug. 13, 1877.	Per S. O. No. 18, C. S. 1877.
Fields, J. L.	First Lieutenant and Adjutant on Staff of Colonel commanding First Infantry Regiment, Second Brigade, N. G. C.	Oct. 10, 1877.	Nov. 28, 1877.	Per S. O. No. 27, C. S. 1877.
Foster, J. R.	Major and Brigade Inspector on Staff of Brigadier-General commanding Fourth Brigade, N. G. C.	Mar. 28, 1878.	Mar. 28, 1878.	Per S. O. No. 5, C. S. 1878.
Gilmore, John H.	First Lieutenant McMahon Guard, Company "H," Third Infantry Regiment, Second Brigade, N. G. C.	Sept. 12, 1877.	Sept. 25, 1877.	Per S. O. No. 21, C. S. 1877.
Gramm, G. W.	Colonel commanding First Infantry Regiment, Second Brigade, N. G. C.	Oct. 15, 1877.	Nov. 13, 1877.	Per S. O. No. 25, C. S. 1877.

TABLE J—Continued.

NAME.	Rank, Etc.	Date of Resignation.	Date of Acceptance.	Remarks.
Grow, Charles A.	Major and Aid-de-Camp on Staff of Major-General commanding N. G. C.	May 15, 1878.	June 15, 1878.	Per S. O. No. 10, C. S. 1878.
Howard, Charles.	Second Lieutenant Thompson Rifles, Company "B," Second Infantry Regiment, Second Brigade, N. G. C.	Aug. 31, 1877.	Sept. 25, 1877.	Per S. O. No. 21, C. S. 1877.
Horan, M. S.	Brigadier-General commanding Fourth Brigade, N. G. C.	Nov. 4, 1878.	Dec. 30, 1878.	Per G. O. No. 10, C. S. 1878.
Hunt, Edwin O.	Major and Inspector of Rifle Practice on Staff of Brigadier-General commanding Second Brigade, N. G. C.	Mar. 31, 1879.	April 28, 1879.	Per S. O. No. 14, C. S. 1879.
Hebbard, J. C.	Major in the N. G. C. and Military Instructor, "St. Matthew's Hall."	June 6, 1879.	July 31, 1879.	Per S. O. No. 26, C. S. 1879.
Jones, Bartlett F.	Second Lieutenant San Francisco Cadets, Company "H," Second Infantry Regiment, Second Brigade, N. G. C.	Nov. 24, 1877.	Dec. 6, 1877.	Per S. O. No. 28, C. S. 1877.
Jones, Martin.	Captain Light Guard, Company "F," First Infantry Regiment, Second Brigade, N. G. C.	Feb. 20, 1879.	Mar. 5, 1879.	Per S. O. No. 8, C. S. 1879.
Laufkotter, C. A.	Captain Sarsfield Guard, Company "G," First Battalion of Infantry, Fourth Brigade, N. G. C.	Dec. 10, 1878.	Jan. 10, 1879.	Per S. O. No. 1, C. S. 1879.
Mulvenna, James.	Captain San Jose Zouaves (unattached), Second Brigade, N. G. C.	Dec. 9, 1877.	Jan. 7, 1878.	Per S. O. No. 1, C. S. 1878.
Metcalf, Charles W.	Junior Second Lieutenant Sacramento Light Artillery (unattached), Fourth Brigade, N. G. C.	Dec. 29, 1877.	Jan. 30, 1878.	Per S. O. No. 2, C. S. 1878.
Maguire, James G.	Second Lieutenant Meagher Guard, Company "D," Third Infantry Regiment, Second Brigade, N. G. C.	Jan. 8, 1879.	Jan. 20, 1879.	Per S. O. No. 2, C. S. 1879.
Murray, Wm. F.	Second Lieutenant Summer Light Guard, Company "E," First Infantry Regiment, Second Brigade, N. G. C.	Feb. 22, 1879.	Mar. 5, 1879.	Per S. O. No. 8, C. S. 1879.
McClintock, Wm. H.	First Lieutenant Light Guard, Company "F," First Infantry Regiment, Second Brigade, N. G. C.	July 1, 1879.	July 25, 1879.	Per S. O. No. 23, C. S. 1879.
Pierson, Wm. M.	Lieutenant-Colonel and Judge Advocate on Staff of Major-General commanding N. G. C.	Sept. 17, 1878.	Feb. 6, 1879.	Per S. O. No. 4, C. S. 1879.
Robbins, J. M.	Captain Sacramento Light Artillery (unattached), Fourth Brigade, N. G. C.	June 3, 1878.	Aug. 3, 1878.	Per S. O. No. 15, C. S. 1878.
Robison, A. C.	First Lieutenant San Francisco Cadets, Company "H," Second Infantry Regiment, Second Brigade, N. G. C.	April 30, 1879.	May 9, 1879.	Per S. O. No. 15, C. S. 1879.
Robertson, Joshua.	First Lieutenant Summer Light Guard, Company "E," First Infantry Regiment, Second Brigade, N. G. C.	May 17, 1879.	June 18, 1879.	Per S. O. No. 18, C. S. 1879.
Supple, Edward.	Second Lieutenant Meagher Guard, Company "D," Third Infantry Regiment, Second Brigade, N. G. C.	Aug. 23, 1877.	Sept. 7, 1877.	Per S. O. No. 20, C. S. 1877.
Sanford, E. M.	Brigadier-General commanding First Brigade, N. G. C.	April 8, 1878.	April 20, 1878.	Per G. O. No. 2, C. S. 1878.
Shorb, J. Campbell.	Colonel and Surgeon-General on the Staff of the Governor and Commander-in-Chief, N. G. C.	July 29, 1878.	Aug. 16, 1878.	Per G. O. No. 7, C. S. 1878.

Stuart, John.....	Captain National Guard, Company "C," First Infantry Regiment, Second Brigade, N. G. C.-----	Nov. 4, 1878.	Nov. 11, 1878.	Per S. O. No. 21, C. S. 1878.
Smith, Sidney M.-----	First Lieutenant and Quartermaster on Staff of Colonel commanding First Infantry Regiment, Second Brigade, N. G. C.-----	Nov. 10, 1878.	Feb. 7, 1879.	Per S. O. No. 5, C. S. 1879.
Sarpy, J. B. O.-----	First Lieutenant Oakland Guard (unattached), Second Brigade, N. G. C.-----	Mar. 7, 1879.	Mar. 22, 1879.	Per S. O. No. 10, C. S. 1879.
Taylor, Thomas S.-----	First Lieutenant and Adjutant on Staff of Colonel commanding Second Infantry Regiment, Second Brigade, N. G. C.-----	June 26, 1878.	June 28, 1878.	Per S. O. No. 12, C. S. 1878.
Vernon, George R.-----	Major-General commanding N. G. C.-----	Mar. 18, 1878.	Mar. 29, 1878.	Per G. O. No. 1, C. S. 1878.
Woeber, Peter-----	First Lieutenant San Francisco Fusiliers, Company "C," Second Infantry Regiment, Second Brigade, N. G. C.-----	Mar. 8, 1879.	Mar. 22, 1879.	Per S. O. No. 10, C. S. 1879.
Woodward, E. W.-----	First Lieutenant Oakland Light Cavalry (unattached), Second Brigade, N. G. C.-----	June 6, 1879.	June 18, 1879.	Per S. O. No. 18, C. S. 1879.

Died.

NAME.	Rank, Etc.	Date of Death.
Bailey, A. M.-----	Major and Quartermaster on Staff of Brigadier-General commanding Fifth Brigade, N. G. C.-----	August 1, 1877.
Hadley, David F.-----	Major and Engineer Officer on Staff of Brigadier-General commanding Third Brigade, N. G. C.-----	November 20, 1878.
Kafitz, J. P.-----	Major and Ordnance Officer on Staff of Brigadier-General commanding Third Brigade, N. G. C.-----	November 20, 1878.
Landeker, Lazare-----	Major and Paymaster on Staff of Brigadier-General commanding First Brigade, N. G. C.-----	April 2, 1879.

TABLE K.

List of Commissions issued to Officers of the University Cadets since August 1, 1877.

NAME AND GRADE.	Date of Rank.	Date of Commission.
<i>Captains.</i>		
Frank Gray Easterby	May 21, 1878	June 3, 1878.
Lemuel Warren Cheney	May 22, 1878	June 3, 1878.
William Martin Van Dyke	May 23, 1878	June 3, 1878.
Fiesco Mundlebaum	May 24, 1878	June 3, 1878.
Alexander Francis Morrison	May 25, 1878	June 3, 1878.
Edgar Curtis Sutcliffe	May 26, 1878	June 3, 1878.
Frederick William Zeile	May 27, 1878	June 3, 1878.
Clarence Harrison Warren	May 28, 1878	June 3, 1878.
William Scott Charleston	May 17, 1879	May 28, 1879.
Fremont Morse	May 18, 1879	May 28, 1879.
Marcellus Americus Dorn	May 19, 1879	May 28, 1879.
Charles William Slack	May 20, 1879	May 28, 1879.
Walter Henry Nicholson	May 21, 1879	May 28, 1879.
George Beale Wilcutt	May 22, 1879	May 28, 1879.
William Henry Morrow	May 23, 1879	May 28, 1879.
William Howland Leflingwell	May 24, 1879	May 28, 1879.
<i>First Lieutenants.</i>		
James Bruce Clow	May 21, 1878	June 3, 1878.
Charles Munson Stetson	May 22, 1878	June 3, 1878.
Thomas Orlando Toland	May 23, 1878	June 3, 1878.
William Richard Poyzer	May 24, 1878	June 3, 1878.
Walter Brewster Jones	May 25, 1878	June 3, 1878.
William Fulton Soule	May 26, 1878	June 3, 1878.
Christopher Stoddard Batterman	May 17, 1879	May 28, 1879.
John Hoffman Wheeler	May 18, 1879	May 28, 1879.
Morris Bien	May 19, 1879	May 28, 1879.
George Powers Kelsey	May 20, 1879	May 28, 1879.
George Cooper Pardee	May 21, 1879	May 28, 1879.
George Sexton Edwards	May 22, 1879	May 28, 1879.
William H. Chapman	May 23, 1879	June 17, 1879.
<i>Second Lieutenants.</i>		
Frank William Maher	May 21, 1878	June 3, 1878.
George Everett Fogg	May 22, 1878	June 3, 1878.
Walter Forsythe Finnie	May 23, 1878	June 3, 1878.
Frederick Wellington Morse	May 24, 1878	June 3, 1878.
Joseph William Winans	May 25, 1878	June 3, 1878.
Edward Gilman Knapp	May 17, 1879	May 28, 1879.
Thomas Addis McMahon	May 18, 1879	May 28, 1879.
Edmund O'Neill	May 19, 1879	May 28, 1879.
Clarence Holmes Wallace	May 20, 1879	May 28, 1879.
Frederick William Henshaw	May 21, 1879	May 28, 1879.
Frank Benjamin Clowes	May 22, 1879	May 28, 1879.
Henry Irving Coon	May 23, 1879	May 28, 1879.
Carroll Melvin Davis	May 24, 1879	May 28, 1879.
James Lee Cotton	May 25, 1879	May 28, 1879.
Charles Henry Congdon	May 26, 1879	May 28, 1879.

TABLE L.
List of Pardons granted to members of National Guard of California dishonorably discharged.

NAME.	Company Dishonorably Discharged From.	Application for Pardon—By Whom Made.	Date of Pardon.	Remarks.
Beech, George J.-----	Oakland Guard (unattached), Second Brigade, N. G. C.-----	Captain H. D. Ranlett-----	July 10, 1878.-----	Per S. O. No. 14, C. S. 1878.
Baker, Robert G.-----	Company "B," Second Infantry Regiment, Second Brigade, N. G. C.-----	Captain H. Schaffner-----	Aug. 23, 1878.-----	Per S. O. No. 16, C. S. 1878.
Carroll, Patrick-----	Company "B," Second Infantry Regiment, Second Brigade, N. G. C.-----	Captain H. Schaffner-----	Aug. 23, 1878.-----	Per S. O. No. 16, C. S. 1878.
Colvin, John J.-----	Union Guard, Company "A," Gatling Battery, Second Brigade, N. G. C.-----	Captain A. J. Fritz-----	Mar. 22, 1879.-----	Per S. O. No. 11, C. S. 1879.
Dornin, George D.-----	Oakland Guard (unattached), Second Brigade, N. G. C.-----	Captain H. D. Ranlett-----	Nov. 27, 1878.-----	Per S. O. No. 23, C. S. 1878.
Gavigan, William-----	Franklin Light Infantry, Company "D," First Infantry Regiment, Second Brigade, N. G. C.-----	Captain R. H. Orton-----	Aug. 23, 1878.-----	Per S. O. No. 16, C. S. 1878.
Gladding, Theodore-----	Oakland Guard (unattached), Second Brigade, N. G. C.-----	Captain H. D. Ranlett-----	Nov. 27, 1878.-----	Per S. O. No. 23, C. S. 1878.
Heritage, John L.-----	Company "B," Second Infantry Regiment, Second Brigade, N. G. C.-----	Captain H. Schaffner-----	Mar. 6, 1879.-----	Per S. O. No. 9, C. S. 1879.
Hogan, Dennis-----	Meagher Guard, Company "D," Third Infantry Regiment, Second Brigade, N. G. C.-----	Captain D. J. Sullivan-----	June 19, 1879.-----	Per S. O. No. 19, C. S. 1879.
Murphy, John-----	Stockton Guard (unattached), Third Brigade, N. G. C.-----	Captain Eugene Lehe-----	Dec. 11, 1878.-----	Per S. O. No. 24, C. S. 1878.
O'Neill, Benjamin-----	Sarsfield Guard, Company "G," First Battalion of Infantry, Fourth Brigade, N. G. C.-----	Captain C. A. Laufkotter-----	Aug. 23, 1878.-----	Per S. O. No. 16, C. S. 1878.
Van Zandt, John K.-----	Oakland Guard (unattached), Second Brigade, N. G. C.-----	Captain H. D. Ranlett-----	July 10, 1878.-----	Per S. O. No. 14, C. S. 1878.

GENERAL ORDERS.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA,
ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, August 20th, 1877. }

[*General Orders, No. 3.*]

I. The attention of commanding officers of the National Guard is directed to the following sections of the Codes:

SECTION 1970. The commanding officer of each company must, in the month of September in each year, muster and inspect his company, and make out and certify triplicate muster rolls showing the names and number of the members of the company, the officers in the order of their rank, and the privates in alphabetical order; and he must also attach to each roll a list of the ordnance, ordnance stores, arms, accouterments, clothing, and other property of the State in possession of the company. He must transmit, through the proper military channels, one copy of the roll and list attached, to the Major-General, one to the Brigadier-General of his brigade, and one to the Adjutant-General.

SEC. 1971. If such company forms a part of any organized battalion or regiment, the commanding officer thereof must transmit the same, with a muster roll of the field and staff officers of his regiment or battalion, to the Adjutant-General, through the proper channels of military correspondence.

SEC. 1972. When any regiment or battalion is composed of companies located in any one town or city of the State, the same may be mustered by its commanding officer as a regiment or battalion.

II. It is hereby enjoined on all officers having the preparation of muster rolls, to use care and diligence in making out the same; and they are reminded that it is an important duty, and should not be performed in a careless or hasty manner. The following rules should be observed:

1. The writing should be distinct and legible.
2. The names should be set down correctly, as signed on oath of enlistment, or re-enlistment; and if there is found to be any difference between any names on the oath and on the last muster roll, it should be so stated, and correction made under head of "Remarks."
3. Original date of enlistment should be accurate, and mistakes, if any, in last muster, noted.
4. Re-enlistments, particularly the last, should be recorded in harmony with oath.
5. Names omitted from the present muster roll should be entered under "Changes since last annual muster," with a statement of the cause of omission of each name.

III. A full and correct list of the State property in possession of the different commands will be made, and omissions from last inspection will be included.

IV. Brigade and regimental commanders are instructed to give special attention and supervision to the above, to the end that the indicated requirements may be secured, and thus prevent the supplementary work of last year.

V. As the 9th of September falls this year on a Sunday, the respective Brigade Commanders are authorized to prescribe some week-day in the month for the parade, and will, if they deem it advisable, order the muster and inspection to take place on the same day.

VI. Reports of the parade must be forwarded to these Headquarters, with the muster rolls, previous to October 20th, 1877.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA,
ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, October 10th, 1877. }

[*General Orders, No. 4.*]

I. Company commanders of the National Guard and of academies, independent companies, etc., having in their possession State military property of the following kind, viz.: muzzle loading rifles; Colt's or Starr's pistols; sabres, light or heavy; sabre belts, plates, etc.; infantry equipments or portions thereof in excess of what they actually require, or in a useless condition, or who are indebted to the State for such, will collect and procure the same and have them ready for such disposition as may hereafter be required.

II. Officers of the National Guard will immediately report the number to their respective brigade commanders, who will report the same to these headquarters.

III. The purpose of this order being to procure for return to the United States authorities as much as possible of the property issued the State in excess of its quota, so that new arms and equipments may be obtained, it is hereby enjoined on all having such property, or against whom it is charged, to comply with its requirements.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
 ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, March 29th, 1878. }

[General Orders, No. 1.]

I. Major-General George R. Vernon, commanding National Guard of California, having tendered his resignation, the same is accepted to take effect from March 24th, 1878.

II. The following appointment, made by the Governor, is promulgated for the information of all concerned:

Major E. J. Lewis, of Tehama, to be Major-General of the National Guard of California, vice George R. Vernon, resigned, with rank from date of this order.

He will be obeyed and respected accordingly.

By order of the Commander-in-Chief.

P. F. WALSH,
 Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
 ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, April 20th, 1878. }

[General Orders, No. 2.]

I. Brigadier-General E. M. Sanford having tendered his resignation of the command of the First Brigade, National Guard of California, the same is hereby accepted, to take effect from this date.

II. In accepting this resignation the Commander-in-Chief desires to express his high appreciation of the officer resigning.

III. The following appointment, made by the Governor, is promulgated for the information of all concerned: P. W. Murphy, of San Luis Obispo County, is hereby appointed Brigadier-General of the First Brigade, National Guard of California, vice E. M. Sanford, resigned, with rank from date of this order.

By order of the Commander-in-Chief.

P. F. WALSH,
 Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
 ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, April 27th, 1878. }

[General Orders, No. 3.]

I. The following appointment, on the Staff of the Commander-in-Chief, is hereby announced for the information of the National Guard of California: Major James A. Laven, of San Francisco, to be Colonel and Inspector-General of Rifle Practice. He will be obeyed and respected accordingly.

II. The Inspector-General of Rifle Practice will issue such instructions as may be necessary to promote the efficiency of the National Guard of California in the use of their respective arms; and the hearty and cordial support of commanding officers, and the ready and prompt cooperation and response of the members of the respective organizations, is asked for the Inspectors of Rifle Practice.

III. Commanding officers who are authorized by law to appoint Inspectors of Rifle Practice, and who have not yet done so, will forward appointments for commissions.

By order of the Commander-in-Chief.

P. F. WALSH,
 Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
 ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, April 29th, 1878. }

[General Orders, No. 4.]

I. The National Guard is hereby ordered to parade in conformity with law, for target practice, during the month of May (Sundays excepted), under the supervision of the Inspectors of Rifle Practice.

II. Each man will fire 5 shots at a white target, 6 feet by 4, divided into four parts: "Bull's eye," black circle 8 inches in diameter; each hit in this circle giving a credit of five points. "Center," 26-inch (in diameter) circle; each hit in this circle giving a credit of 4 points. "Inner," 46-inch (in diameter) circle; each hit in this circle giving a credit of 3 points. "Outer," all the rest of the target; each hit therein giving a credit of 2 points.

III. The distance for companies armed with Springfield rifles, cal. 45, and cal. 50, will be 200 yards; pull of trigger not less than 6 pounds.

IV. The distance for companies armed with Springfield rifles, cal. 58, model 1862, will be 150 yards.

V. The distance for cavalry, armed with carbines, will be 200 yards; with pistols, 30 yards.

VI. Artillery companies will use such targets as is usual for their respective pieces, and conform to such distance as the formation of the locality selected for practice will permit.

VII. Reports of target practice will be made to General Headquarters by the Inspector-General of Rifle Practice, as provided by law.

VIII. Brigade Commanders will issue such orders as may be necessary, according to the circumstances of their respective commands, to insure performance of the requirements of these general orders.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, June 15th, 1878. }

[*General Orders, No. 5.*]

I. In accordance with the provisions of Paragraph 1, Section 2018, Political Code, the National Guard of California will parade on the 4th day of July.

II. In the Second Brigade such parade shall be by brigade, and in the other brigades in such manner as the number and location of companies will permit. Companies of the Second Brigade, located outside of San Francisco, may, in the discretion of the Brigade Commander, be excused from parading with brigade.

III. It is enjoined on all commands to parade with full numbers, and celebrate in a becoming manner, as citizen-soldiers, the one hundred and second anniversary of American Independence.

IV. Brigade Commanders are hereby directed to forward to General Headquarters, on or before July 10th, 1878, a parade report of their respective commands.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, July 1st, 1878. }

[*General Orders, No. 6.*]

I. In compliance with the requirements of Section 2029, Political Code, Company Commanders will, on receipt of the book herewith transmitted, cause the same to be used for recording the assemblages of their commands, and, in connection therewith, their attention is directed to Section 1936 and Sections 2018 to 2030, Political Code.

II. As the record of excuses of absentees will be for future reference, to determine the right of claimants for exemption, excuses should be well considered by commanding officers, so that applications for pardon may not be unnecessarily increased, and also that the company rolls may be relieved of the names of those who persist in being amenable to the penalty provided in Section 2028, Political Code, and who should not be permitted to have a claim on the privileges intended only for members of the National Guard of California who faithfully perform their duty.

III. Duplicate books will be furnished companies that desire to retain a copy, to be kept with company records.

IV. Blank forms of monthly returns are herewith forwarded. The same abbreviations as given in record of assemblages will be used, whenever applicable, in monthly returns.

V. Brigade Commanders are hereby directed to forward said monthly returns to these Headquarters, within ten days after their receipt by them, so that a correct record of the National Guard of California may be kept.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, August 16th, 1878. }

[*General Orders, No. 7.*]

Colonel J. Campbell Shorb, Surgeon-General on the Staff of his Excellency, the Governor and Commander-in-Chief, having tendered his resignation, the same is hereby accepted, to take effect from this date.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
 ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, August 26th, 1878. }

[*General Orders, No. 8.*]

I. In conformity with the provisions of Section 2018 of the Political Code, the National Guard of California will parade on the 9th of September.

II. The hour and place of such parade will be determined by the respective Brigade Commanders, with a view to accommodating the wishes of the organizations that purpose visiting the State Fair.

III. The annual muster provided for in Section 1970, Political Code, may take place on the same date, or any other day of the month (Sundays excepted), approved by the Brigade Commander.

IV. Commanders of companies are enjoined to prepare their respective rolls accurately, and under the head of "Changes since last annual muster," to make correct records. Blank muster rolls can be obtained on application to Brigade Headquarters.

V. The following section, added by the last Legislature to the Political Code, and omitted from the first copies of the "Provisions of the Codes relative to the Militia of the State of California," issued from these Headquarters, is hereby published for the information and observance of all concerned:

SECTION 2100. All military property paid for out of moneys allowed by the State, shall be held to be the property of the State, and must be enumerated in the annual muster roll next following its purchase.

VI. Under the head of "Losses since last annual muster," account for articles worn out, broken, and unavoidably lost, so that the ordnance and other property account can be correctly kept between the State and the National Guard of California. Damaged arms must be returned to the State Armory in order to get credit therefor.

By order of the Commander-in-Chief.

P. F. WALSH,
 Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
 ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, October 1st, 1878. }

[*General Orders, No. 9.*]

The following is promulgated for the information of the National Guard of California, and persons having business with this Department:

I. The resignation of George E. Aiken, Major and Assistant Adjutant-General, on the Staff of the Adjutant-General of California, is hereby accepted, to take effect from this date.

II. P. J. Harney is hereby appointed Major and Assistant Adjutant-General, on the Staff of the Adjutant-General of California, vice George E. Aiken, resigned, with rank from date.

He will be obeyed and respected accordingly.

By order of the Commander-in-Chief.

P. F. WALSH,
 Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
 ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, December 30th, 1878. }

[*General Orders, No. 10.*]

I. Brigadier-General M. S. Horan, commanding Fourth Brigade, National Guard of California, having tendered his resignation, the same is hereby accepted, to take effect from this date.

II. Major Thomas J. Clunie, of Sacramento, is hereby appointed Brigadier-General of the Fourth Brigade, National Guard of California, vice M. S. Horan, resigned, with rank from date. He will be obeyed and respected accordingly.

By order of the Commander-in-Chief.

P. F. WALSH,
 Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
 ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, April 18th, 1879. }

[*General Orders, No. 1.*]

I. In accordance with the requirements of Section 2018, Subdivision 3, of the Political Code, the National Guard of California will parade in the month of May, for target practice (Sundays excepted), under the supervision of the Inspectors of Rifle Practice.

II. The following instructions, prepared by the General Inspector of Rifle Practice, will be observed:

1. In the target practice of the National Guard of California, the rules of the "California Rifle Association" shall govern.

2. The distance for companies armed with Springfield rifles, cal. 45 and cal. 50, shall be 200 yards.

3. For companies armed with Springfield rifles, cal. 58, model of 1862, 150 yards.

4. Each man will fire five shots, and no sighting shots will be allowed.

5. The distance for cavalry companies, armed with carbines, shall be 200 yards.

6. Commanders of unattached companies will furnish a correct roll of the members of their respective commands to the Brigade Inspector of Rifle Practice, and give him timely notice of the day and place selected for target practice, so that arrangements can be made to have an Inspector present.

7. Reports of target practice must be forwarded to the General Inspector of Rifle Practice, not later than ten days after such practice shall have been held.

8. The Regimental and Battalion Inspectors of Rifle Practice shall forward to the Brigade Inspector of Rifle Practice, within five days after such practice shall have taken place, certified copies of the same. Inspectors will carefully preserve the original reports, so they may be enabled to furnish information concerning such practice as may be called for, from time to time, by commanders of regiments, battalions, etc., and such others as may be entitled to the information contained therein.

9. When practicable, commissioned officers should be detailed to act as score-keepers at the firing points, and at least one non-commissioned officer should be detailed to assist at the targets, and Inspectors will call on their respective commanders for such detail as they may require for this purpose.

10. Inspectors should provide themselves with full rolls of the members of the various companies of their regiments or battalions at least one day prior to any contemplated target practice; and also know, from personal observation, that the targets, discs, weights, etc., are in readiness, thus obviating any unnecessary delay on the arrival of the companies at the grounds.

III. Brigade commanders will issue such orders as they may deem proper prescribing target practice for the artillery companies of their respective commands, and to insure the proper compliance with these general orders.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, June 20th, 1879. }

[General Orders, No. 2.]

I. In accordance with law, and in commemoration of the one hundred and third anniversary of American Independence, the National Guard of California will parade on the 4th day of July.

II. Brigade Commanders will issue such orders as they may deem necessary to occasion a full parade of their respective commands.

III. A parade report of the respective commands will be forwarded by Brigade Commanders to these Headquarters, on or before July 10th, 1879.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SPECIAL ORDERS.

GENERAL HEADQUARTERS, STATE OF CALIFORNIA, }
ADJUTANT-GENERAL'S OFFICE, SACRAMENTO, August 29th, 1877. }

[Special Orders, No. 19.]

Leave of absence for sixty days from date is hereby granted to the following commissioned officers of the Second Brigade, N. G., who have been selected to represent the National Guard of this State in the inter-State military match of 1877, to take place at Creedmoor, New York: Brigadier-General John McComb, commanding Second Brigade, N. G.; Captain H. J. Burns, commanding Company "E," First Infantry Regiment; Captain W. H. Brockhoff, commanding Company "D," Second Infantry Regiment; Second Lieutenant Joshua Robertson, Company "E," First Infantry Regiment.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, November 13th, 1877.

[*Special Orders, No. 25.*]

I. Colonel G. W. Granniss, commanding First Infantry Regiment, Second Brigade, N. G., having tendered his resignation on the 15th ult., the same is hereby accepted, to take effect from this date.

II. In accepting this resignation, the Commander-in-Chief desires to express his recognition of the valuable services rendered by Colonel Granniss to the National Guard during his twenty years connection therewith.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, February 26th, 1878.

[*Special Orders, No. 3.*]

On the recommendation of the Colonel commanding Second Infantry Regiment, Second Brigade, N. G., and the approval of the Brigade Commander, the following is promulgated :

I. Companies "B" and "E," Second Infantry Regiment, Second Brigade, N. G., having rendered themselves liable to disbandment under Section 2020, Political Code, but considering that disbandment would, in the present instance, work injustice to the members of both companies who have complied with the law, it is hereby ordered that, instead of being disbanded, said companies be consolidated into one company, composed of the enlisted men of each of said companies entitled, according to the provisions of the Codes, to credit for the time already served ; such consolidation to be effected as hereinafter provided.

II. Brigadier-General John McComb, commanding Second Brigade, N. G., is hereby directed to appoint a proper officer to supervise such consolidation, who shall notify the enlisted men of said companies to attend a joint meeting at a stated time and place, to be held within ten days following his appointment, and shall thereat transfer to a new muster-roll the names of such enlisted men as are entitled to, and who desire to avail themselves of the provisions of paragraph one of this order, giving each credit of enlistment from original date of enlistment in Companies "B" and "E," and recording same on muster-roll of new company.

III. Said consolidated company can adopt any letter and name not in use at the time of consolidation in the said Second Infantry Regiment, and meet within ten days thereafter for the election of company officers.

IV. It shall be the duty of the supervising officer appointed by the Brigade Commander, to take charge of the property in possession of Companies "B" and "E," and report the amount thereof through the proper channels to these Headquarters, so that receipts therefor may be forwarded.

V. The commissioned officers of Companies "B" and "E," Second Infantry Regiment, Second Brigade, N. G., are hereby honorably mustered out of the State service.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, March 18th, 1878.

[*Special Orders, No. 4.*]

I. The application of citizens and residents of the City and County of San Francisco, desirous of organizing a company of infantry, having been approved, said company will be immediately mustered into the State service, and be attached to the Second Infantry Regiment, Second Brigade, N. G., under the name and title of Company "F," of said regiment.

II. Brigadier-General John McComb, commanding Second Brigade, N. G., will, upon receipt of these orders, appoint some person resident of the county, to muster in said company according to the provisions of the Militia Code.

III. Copies of orders, a record of proceedings, and muster-roll will be forwarded to this office through Brigade Headquarters.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, April 8th, 1878.

[*Special Orders, No. 6.*]

In pursuance of the action of the Board of Location and Organization, had on this date, the following is hereby ordered :

I. The four Gatling guns in possession of Union Guard, Company "A," Second Infantry Regiment, Second Brigade, N. G. C., are hereby permanently assigned to said company ; and an election will be held therein as soon as the proper orders are issued for the additional officers provided for in paragraph four, Section 1962, Political Code.

II. On the first of July, 1878, said company will be detached from the Second Infantry Regiment, Second Brigade, N. G. C., and will be thereafter known as the "Union Guard, Company

A. Gatling Battery," Second Brigade, N. G. C., and be entitled to receive the allowances provided for in Section 1962, Political Code.

III. Colonel William R. Smedberg, commanding the Second Infantry Regiment, Second Brigade, N. G. C., is hereby authorized to organize an infantry company, which shall be attached to said regiment, to fill the vacancy which will be created therein by the organization of the Gatling Battery.

IV. Brigadier-General John McComb, commanding Second Brigade, N. G. C., is hereby directed to issue such necessary orders as may be required to carry the provisions of this order into full force and effect.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, June 13th, 1878.

[*Special Orders, No. 8.*]

In accordance with the provisions of Section 1974, Political Code, the following named officers are appointed an Examining Board, for the Second Brigade, N. G. C.:

Lieutenant-Colonel David Wilder, First Infantry Regiment.

Captain Robert Cleary, Company "E," Third Infantry Regiment.

Captain Francis W. Bacon, Company "F," Second Infantry Regiment.

They will be obeyed and respected accordingly.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, July 9th, 1878.

[*Special Orders, No. 13.*]

I. On the recommendation of the Brigadier-General, commanding Second Brigade, N. G. C., Captain F. W. Bacon, Company "F," Second Infantry, is hereby relieved from duty on the Examining Board of the Second Brigade.

II. Lieutenant-Colonel H. H. Thrall, Second Infantry Regiment, Second Brigade, N. G. C., is hereby appointed to fill the vacancy caused in paragraph one, of this order.

He will be obeyed and respected accordingly.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, August 27th, 1878.

[*Special Orders, No. 17.*]

I. The application of citizens and residents of Oakland, Alameda County, desirous of organizing a company of cavalry having been approved, Brigadier-General John McComb, commanding Second Brigade, N. G. C., will, upon receipt hereof, issue all orders necessary, and appoint some person resident of the county to organize said company according to the provisions of the Militia Code.

II. Copies of orders, a record of proceedings, and muster-rolls, will be transmitted to this office through Brigade Headquarters.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, February 10th, 1879.

[*Special Orders, No. 6.*]

I. In accordance with the wish of the members of the company, the Siskiyou Guard, unattached, Fifth Brigade, N. G. C., is hereby mustered out of the State service.

II. The Adjutant-General will take the necessary steps to have the arms and equipments that were issued for the use of the company returned to the State Armory.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, February 10th, 1879.

[*Special Orders, No. 7.*]

I. The application of citizens and residents of Eureka, Humboldt County, desirous of organizing a company of infantry, having been approved, Brigadier-General J. G. Wall, commanding Sixth Brigade, N. G. C., will, upon receipt hereof, issue all orders necessary, and appoint some person, resident of the county, to organize said company according to the provisions of the Militia Code.

II. Copies of orders, a record of proceedings, and muster-rolls, will be duly transmitted to this office through Brigade Headquarters.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, April 4th, 1879.

[*Special Orders, No. 12.*]

Lieutenant-Colonel M. C. Bateman, Third Infantry Regiment, Second Brigade, N. G. C., having faithfully served as a commissioned officer of the National Guard of California for the continuous period of ten years, is hereby, in accordance with the provisions of Section 1973, of the Political Code, placed upon the retired list, with the rank of Lieutenant-Colonel.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, June 24th, 1879.

[*Special Orders, No. 20.*]

George W. Chapin, Senior First Lieutenant, First California Guard, unattached, Second Brigade, N. G. C., having faithfully served as a commissioned officer of the National Guard of California for the continuous period of ten years, is hereby, in accordance with the provisions of Section 1973, of the Political Code, placed upon the retired list with the rank of First Lieutenant.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, June 25th, 1879.

[*Special Orders, No. 21.*]

Permission is hereby granted to the Emmet Guard, Company "E," Third Infantry Regiment, Second Brigade, N. G. C., to leave the State for the purpose of visiting Virginia City, State of Nevada.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, July 25th, 1879.

[*Special Orders, No. 22.*]

Captain E. D. Hagen, Sacramento Light Artillery, unattached, Fourth Brigade, N. G. C., having been absent without leave for the period of five months, said office is hereby declared vacant, and the Brigadier-General commanding Fourth Brigade, N. G. C., will issue the necessary orders for an election to fill the same.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, July 28th, 1879.

[*Special Orders, No. 25.*]

Colonel Chalmers Scott, Chief Engineer on the Staff of his Excellency, the Governor and Commander-in-Chief, N. G. C., is hereby detailed to hold an inspection of the Los Angeles Guard, unattached, First Brigade, N. G. C., located at Los Angeles, California, and to report result to these Headquarters.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

SACRAMENTO, July 31st, 1879.

[*Special Orders, No. 26.*]

The resignation of J. C. Hebbard, Major in the National Guard of California, and Military Instructor "St. Matthew's Hall," San Mateo, California, is hereby accepted, to take effect from this date.

By order of the Commander-in-Chief.

P. F. WALSH,
Adjutant-General.

REPORTS OF GENERAL OFFICERS, OF CAPTAIN OF CALIFORNIA TEAM, AND OF THE PROFESSOR OF MILITARY SCIENCE AND TACTICS, UNIVERSITY OF CALIFORNIA.

HEADQUARTERS MAJOR-GENERAL COMMANDING NATIONAL GUARD, }
SAN FRANCISCO, July 18th, 1879. }

Brigadier-General P. F. Walsh, Adjutant-General, California:

SIR: I have the honor to report that the National Guard of the State of California is in an excellent state of efficiency. The reports furnished to these Headquarters by the Division Inspector, Lieutenant-Colonel P. W. Black, an officer of great experience, fully corroborates this statement. The action of the last Legislature in increasing the money appropriations to the several commands was a liberal and wise one, proving, as it does, that our State is not unmindful of the guardians of its peace, who are ready at all times to risk limb and life in its service, when called upon to do so by the properly constituted authorities. The effect of such legislation, and that conferring upon members of the National Guard certain special privileges and exemptions, gives satisfaction and encouragement, not only to those in the service, but proves an incentive to young men to join the ranks, and acquire skill in the use of military weapons. The rivalry that exists, and the proficiency attained by and among the various companies of the National Guard in rifle shooting, is evidenced from the report of Lieutenant-Colonel C. M. Gilmore, Division Inspector of Rifle Practice, who has devoted much time and attention to his department. In this connection, I have great pleasure in stating that great credit is due for this spirit of emulation and remarkable progress in the use of the rifle to the zeal and example of the able commander of the Second Brigade, General John McComb. Under his leadership a team selected from among our militia carried off the inter-State prize for rifle shooting, at Creedmoor, New York.

The revised Military Code works admirably well, especially that portion requiring all officers elect to undergo an examination before a Military Board, who are to decide upon the competency of such before they can receive their commissions. This has had the double effect of debarring the incompetent from seeking promotion, and compelling the efficient to still further study the manual of arms.

It would be invidious for me to speak in terms of praise of any particular command where all deserve commendation; but I cannot refrain from reporting most favorably the names of Colonels Woodhams, Smedberg, and Wason, commanding respectively the First, Second, and Third Infantry Regiments, and Major Orton, commanding the Cavalry Battalion in the Second Brigade. The First Regiment gave public proof of its discipline, drill, and efficiency at our late State Fair.

The Second, under its experienced commander, who has made a gallant record in his country's service, bids fair to rival the best disciplined militia regiment in any State, and the Third, having secured a capacious and well appointed new armory, will not allow itself to fall behind its brother regiments, who have had heretofore considerable advantages in this respect.

The Act of the last Legislature in segregating the Gatling Battery, and making it a separate and distinct command, was a good one, as is manifest by the great progress it has made in strength and discipline under its indefatigable commander, Captain A. J. Fritz.

I regret that ill health has prevented me from visiting all the commands in the Division, and otherwise devoting that special attention to details I would desire to do. I am convinced, however, that a personal inspection of the several commands would convince all having the peace, welfare, and best interests of our State at heart, that the National Guard deserves that liberal support and encouragement of our State Government, and that its progress and efficiency should never be crippled or curtailed by hostile or parsimonious legislation.

Yours, respectfully,

E. J. LEWIS,
Major-General Commanding Division National Guard of California.

HEADQUARTERS SECOND BRIGADE, N. G. C., }
No. 523 PINE STREET, SAN FRANCISCO, CALIFORNIA, June 30th, 1879. }

Brigadier-General P. F. Walsh, Adjutant-General of California:

GENERAL: I have the honor to present herewith my biennial report of the condition of the Second Brigade, National Guard of California.

The wholesome amendments to the Codes, adopted by the last Legislature, restoring the exemption from jury duty to those who faithfully render military service, have done much to strengthen the companies and give a larger percentage of attendance at the drills and parades,

as well as on the more serious occasions, when the troops have been called into active service in support of the civil authorities. The consolidated report of the brigade shows an apparent falling off of 100 during the past year; but the brigade is really stronger in active membership by nearly double that number, all the merely ornamental names on company muster rolls having been dropped by the rigid enforcement of the rules laid down in the Codes and promulgated in orders from General Headquarters, requiring the names of absentees to be noted in the Company Record Book, and forwarded on the monthly returns. Those names that had hitherto swollen the roll and detracted from the percentage of attendance were either swept off by reason of the owners having already served their seven years, or have been presented for dishonorable discharge. The enlistments, as you know by the oaths on file, exceed the discharges for exemption, and the result is a stronger active force for any emergency. I must take this opportunity to congratulate you on having inaugurated and successfully carried out the system of accounting for every man borne on the rolls of the companies, as well as requiring the oath of each enlisted man to be forwarded every three years. On your entry into the office of Adjutant-General there was not a complete legal muster roll in the whole of the Second Brigade, and—as I have every reason to believe that the companies in the other brigades were in the same condition—it was simply impossible for you to know the actual strength of the State troops, some of the members having gone on for years after their term of service had expired without re-enlisting—in one case, I believe, a whole company roll did not have a man properly sworn in within the preceding three years. After a great deal of work and many explicit letters you succeeded in bringing order out of the chaos which reigned; and I venture to say that there is no General Headquarters in the United States where there is a more perfect knowledge of the condition of the companies of State troops, as to membership and morale, than you now possess at Sacramento.

The improvement in the "paper work" of the brigade is greatly appreciated by those who know how necessary it is to be exact, and how much of explanatory correspondence is avoided by requiring everything to be done right at first, and keeping it on that line forever after. No name is now dropped from the roll for any cause, except by orders, copies of which are forwarded to General Headquarters, so that the status of each name is accurately noted on the roster of troops, or the same is stricken from the rolls. In supplementing your efforts I have encouraged the printing of company rolls, for general use, as well as for the specific purpose required by Section 1937, and I am of the opinion that the labor will be lightened if printed lists are insisted upon from all the companies. Where they have been used the commanding officers pronounce them very satisfactory, and I am sure they will be found of great assistance at General Headquarters in making quick comparisons for changes since previous muster.

The necessity for passing an examination as to qualification for commissioned officers, after election, has caused diligent study of the tactics on the part of prospective candidates, and it is safe to say that the officers of the Second Brigade are not excelled by the officers of any similar body of troops. This applies also to non-commissioned officers, as there are Examining Boards in the several regiments in addition to the Examining Board for the brigade. A few applicants have been rejected or declined to appear for further examination, but generally the notice that "further time is granted" has resulted in a mastery of the tactics by the candidate, and he has passed with credit at the next examination. The members of the Brigade Examining Board have discharged their duties faithfully and promptly, and deserve not only the thanks of the Commander-in-Chief, but more substantial recognition from the State, in recompense for the time given to the work intrusted to them. I refer you to the carefully prepared reports, regularly sent forward, for the amount of labor done by them in the many sessions held.

The allowances to companies, under the present laws, enable them to maintain their organizations in proper manner without running in debt, and a general feeling of satisfaction prevails; but it is also evident that there should be increased inducements to fit recruits for the active duties of a soldier. The plan of an annual encampment for at least six days has been adopted by the older States, where the necessity for a well-drilled militia is recognized: and to encourage attendance at these encampments, the troops are put on duty with such a rate of pay as will in part recompense for the loss of time from business. The State of California has not provided for the expenses of an encampment since 1863, the encampments and field days since that time being at the expense of the participants, or of the citizens of the localities where the encampments have been held. This is a burden that should be borne by the State, until the National Government makes provision for annual encampments of the militia of each State.

The National Guardsmen of California are anxious to excel in everything, and, if properly encouraged, will certainly reflect credit on the State. In the matter of marksmanship the members of companies of the Second Brigade have expended thousands of dollars to acquire proficiency, putting up targets and bulkheads at convenient places, and making at least weekly trips to practice at the various military distances. Tons of powder and lead have been used in this laudable ambition, and a brilliant result has been produced. The deputation of marksmen to compete in the inter-State military match, at Creedmoor, in 1877, came wholly from the companies of the Second Brigade, the Brigade Commander having the honor to win a place in the Creedmoor Team during the crucial test of 120 shots, fired at the distance of 200 and 300 yards. In that series of competitions, where forty-seven contestants struggled for the first places, the sixteen selected averaged a little short of 80 per cent. of the possible score: in subsequent practice the sixteen members reached 80 per cent., under the disadvantage of strong winds, and in the inter-State military match, at Creedmoor, where four States competed, the representatives of California had the great joy of coming out victorious by the magnificent score of 995 points out of the possible 1,200—within one point of 83 per cent. To have simply

won the trophy would have been a gratifying triumph, but when it was won by 28 points over the New York Team, who had increased their proficiency 14 per cent., it justified the encouraging telegram sent by you to the winners: "The magnificence of the scores made by your competitors enhances the glory of your victory. We are all proud of your achievement."

[The details of this match are given in a report from the Captain of the Team, forwarded to General Headquarters in 1877.]

On the return of the California Creedmoor Team with the trophy of the contest—a bronze statuette, representing "The Soldier of Marathon"—they received flattering demonstrations of welcome from the citizens of Sacramento: were honored with a banquet by the citizens of Stockton, who had exacted a promise that the Team would stop at that city, even if they won second place among the contestants; received honors from the citizens of Oakland, with a grand banquet: and by a grand outpouring of the people of San Francisco, who thronged the streets to witness the parade of the Second Brigade and the volunteer companies who turned out in their honor.

This triumph of the California State troops, using the small arms of the United States arsenals, excited the admiration of the ordnance officers of the government, and merited the following special notice in General S. V. Benét's report to the Secretary of War:

"The rifle issued to the army and the militia compares favorably with the best breech-loader either here or abroad. This was conclusively shown recently in the 'inter-State military match,' at Creedmoor. In the hands of the California Team, from General McComb's brigade, the score made is said never to have been equalled in a military team match. It is an arm that may not be superseded for many years to come; and if it be obliged to yield to one of superior merit the effect will not be to render it obsolete, but to make it secondary to one using the same cartridge but having greater rapidity of fire, so that the present single breech-loader will always be a powerful weapon, even when compared with the possible magazine gun of the future."

General Benét, Chief of Ordnance, U. S. A., manifested a great deal of interest in the achievement of the California Team, and the reports of their intelligent rifle practice at San Bruno, and very readily accepted any suggestions looking to an improvement of the United States Springfield rifle, which had gained extraordinary prominence through the victory of the Californians. In August, 1878, I had the honor to address him a letter on the subject of improving the sights of the rifle for shooting at long distances in strong winds, from which an extract is herewith given:

SAN FRANCISCO, August 19th, 1878.

Brigadier-General S. V. Benét, Chief of Ordnance, U. S. A., Washington, D. C.:

GENERAL: I have the honor to inclose the record of another triumph for the Springfield rifle—this time at long range. The experience gained at this practice leads me to suggest that the rear sight should be altered to a straight bar, "lined" off with bright metal to indicate the center, as at present shown by the V, and each line to right or left to be a little smaller or shorter, and calculated for use as a false center, to get the necessary windage by aiming over to the front sight—the first line for two feet of windage, the second line for four feet, the third for six, the fourth for eight, the fifth for ten—the marks continuing outside of the standards, and the bar lengthened as much as possible without making it objectionable in handling the piece in the manual. I will have a false sight or bar made, and send to you for consideration. The point is, that the marksman is now obliged to aim at some other object, in a strong wind, to allow the bullet to drift to the object intended to be hit. By using the straight bar and choosing a false center the effect of the "wind gauge" is produced, and the front sight can be held on the object intended to be hit.

* * * * *

Adjutant-General Walsh informs me that the account of California with the United States Government has been settled, with a balance in our favor. As I have had some share in the efforts to settle this account, by personal interviews with you, permit me to offer my thanks to you for your kindness in giving the State generous consideration.

I have the honor to be, very respectfully, your obedient servant,

JOHN MCCOMB,
Brigadier-General, Second Brigade, N. G. C.

A rear sight was then devised, which far surpasses the sights on any of the military rifles issued from private factories, enabling the marksman to aim at the bull's-eye while making the allowance for windage by moving the rear sight to right or left, according to the direction of the wind. It has been fashioned in imitation of buck-horns or antlers, to readily catch the eye in throwing the rifle up to the shoulder, and is known as the "buck-horn sight." I earnestly recommend that a requisition be made for a sufficient number of these improved sights, to replace those first issued with the rifles now in use by the State troops, being satisfied that a difference of at least two per cent. will be made in the proficiency of those using the rifle thus improved.

Since my last report two companies have been mustered out of the service, to consolidate the membership in one company—Company B and Company E of the Second Regiment of Infantry. On the application of Colonel Smedberg a new company was formed by the mustering officer, and is now borne on the rolls as Company B, Second Infantry, commanded by Captain Hermann Schaffner. To fill the vacancy in the regimental organization occasioned by the muster-out of Company E, and also to supply the place of Company A, Union Guard, detached by orders of the Commander-in-Chief to act as a separate organization, with four Gatling guns, Colonel Smedberg recruited two fine companies—"F" and "G"—which will compare favorably with any of the older organizations. Captain Francis W. Bacon, the commander of "F Company" (the name the members have chosen), is an officer of fine ability, and very popular with his command. He has succeeded in keeping up a membership of over 90 during the whole of the time he has

been in command, and has frequently paraded 96 per cent. of the strength of the company. "G Company," commanded by Captain Wm. Chamberlain, though not so large in membership, turns out a large percentage of the strength of the roll—in one occasion reporting 100 per cent. The Gatling Battery, commanded by Captain A. J. Fritz, has been recruited to the full strength allowed by the law (149), and is kept at that standard all the time. At one of the inspections Captain Fritz sent to Nevada for one of his sergeants, absent on leave, in order to report "one hundred and forty-nine members present—none absent."

The inspections of companies made by Major Fred. G. Smith, Brigade Inspector, in 1878 and 1879, show a gain in the attendance in the Second Infantry, and a falling off in the other organizations; but this apparant falling off was owing to local causes on the nights designated for the inspections. The consolidated returns of inspections are annexed:

CONSOLIDATED RETURNS
Of Inspections of First, Second, and Third Regiments of Infantry, and First Cavalry Battalion, and Unattached Companies, Second Brigade.

COMPANIES.	When Inspected	Arms	Uniforms	Equipments	Drill	Discipline	Records	Present.			Absent.			Total Roll	Percentage, 1879	Percentage, 1878
								Commanding	N. C. and P.	Total	Commanding	N. C. and P.	Total			
<i>First Regiment Infantry.</i>																
C	June 23	Good	Good	Good	Good	Good	Good	3	47	50	0	17	17	67	74.62	69.56
B	June 23	Good	Fair	Fair	Good	Fair	Good	3	34	37	0	16	16	53	69.81	67.24
E	June 9	Fair	Fair	Bad	Fair	Good	Good	2	37	39	0	17	17	56	69.64	75.47
H	June 9	Fair	Fair	Bad	Bad	Good	Good	2	38	40	1	21	22	62	64.51	74.07
F	June 9	Good	Good	Good	Good	Good	Good	2	34	36	1	24	25	61	59.01	54.68
D	June 9	Good	Good	Good	Good	Good	Good	2	29	31	0	32	32	63	49.20	68.18
								14	219	233	2	127	129	362	64.36	67.74
<i>Second Regiment Infantry.</i>																
D	June 25	Good	Good	Good	Fair	Good	Good	3	46	49	0	5	5	54	90.74	66.13
C	June 25	Good	Good	Good	Good	Good	Good	3	60	63	0	8	8	71	83.73	66.66
F	May 27	Good	Good	Good	Good	Good	Good	3	83	86	0	12	12	98	87.75	84.82
H	July 11	Fair	Fair	Fair	Good	Good	Good	3	49	52	0	10	10	62	83.87	90.
G	June 18	Good	Good	Good	Fair	Good	Good	1	35	36	1	7	8	44	81.81	90.
B	June 16	Fair	Good	Good	Fair	Fair	Good	3	29	32	0	23	23	55	58.18	47.87
								16	302	318	1	65	66	384	82.81	71.15
<i>Third Regiment Infantry.</i>																
H	June 23	Good	Fair	Good	Good	Good	Good	2	35	37	1	14	15	52	71.15	80.
E	June 4	Good	Fair	Fair	Good	Good	Good	2	37	39	1	16	17	56	69.64	75.75
D	June 13	Good	Bad	Fair	Fair	Good	Fair	3	28	31	0	21	21	52	59.61	67.21
A	June 13	Good	Fair	Fair	Fair	Good	Fair	1	33	34	2	27	29	63	53.96	71.87
B	June 13	Good	Fair	Fair	Fair	Good	Fair	3	28	31	0	29	29	60	51.66	64.91

C	June 13	Good	Fair	Fair	Fair	Good	Fair	3	26	29	0	52	52	81	35.80	51.16
<i>First Cavalry Battalion.</i>																
C	June 11	Good	Good	Good	Fair	Good	Fair	3	18	21	0	26	26	47	41.68	58.33
B	June 11	Good	Good	Good	Fair	Good	Fair	3	24	27	1	42	43	70	38.57	56.16
A	June 11	Good	Good	Good	Fair	Good	Fair	4	22	26	0	42	42	68	38.23	58.82
<i>Unattached Companies.</i>																
A, Light Battery	April 22	Fair	Fair	Good	Bad	Fair	Good	3	33	36	2	31	33	69	52.17	---
Vallejo Rifles	May 29	Good	Good	Good	Fair	Good	Good	2	49	51	1	24	25	76	67.10	---
San José Zouaves	June 12	Bad	Bad	Bad	Fair	Bad	Fair	2	28	30	0	33	33	63	47.61	---
A, Gatling	June 24	Good	Good	Good	Good	Good	Good	4	114	118	1	30	31	149	79.19	---
Hewston Guard	August 9	Good	Fair	Good	Fair	Fair	Fair	2	27	29	0	26	26	55	52.72	---
Oakland Light Cavalry	August 18	Good	Good	Good	Good	Good	Good	2	51	53	1	8	9	62	85.48	---
Oakland Guard	August 21	Good	Good	Good	Good	Good	Good	3	53	56	0	11	11	67	83.58	---
								18	355	373	5	163	168	541	68.91	---

* Mustered in since last inspection.

† Company A, detached since last inspection, paroled at that time 87.61 per cent., making the regimental percentage last year 73.75.

Respectfully submitted,

F. G. SMITH,
Major and Inspector, Second Brigade, N. G. C.

SAN FRANCISCO, June 23d, 1879.

My thanks are due to Major Smith for the zeal and fidelity with which he has conducted these inspections, a task involving a great expenditure of time, and requiring great tact as well as thorough knowledge of the details of company and regimental organizations.

I may take this opportunity to say that I am under personal obligations to every member of my staff for the cheerful performance of the duties assigned to them during the active and exciting incidents of the past two years.

Beside the parades required by law, the brigade has paraded in honor of the victorious Creedmoor Team, November 5th, 1877, for the inspection of the Joint Committee on Military Affairs of the Legislature, January 7th, 1878, February 22d, 1878 and 1879—the last being a field day, for review by his Excellency, the Governor, accompanied by Major-General E. J. Lewis, Adjutant-General P. F. Walsh, Brigadier-General Charles Cadwalader, Brigadier-General E. Canavan, Brigadier-General T. J. Clunie, Brigadier-General P. W. Murphy, and their respective staffs.

On the 10th of November, 1877, the State troops were called into active service by the orders of the Mayor of the City of San Francisco, approved by the Governor, and placed under the direction of the Chief of Police for the suppression of an unlawful and riotous assemblage. The troops continued in service for nine days, and were then dismissed.

January 16th, 1878, the troops were again called into active service by order of the Mayor, approved by the Governor, and placed under the direction of the Chief of Police, for eleven days. Reports of these incidents were forwarded at the time.

When the companies of the Second Brigade were called into active service in November, 1877, threats were freely made by the turbulently inclined, that the armories would be seized at a time when the troops were unprepared, and the arms would be turned against those who had been sworn into the State service. Similar threats were made in January, 1878, when the troops were again called into active service; and the same idea has been used several times by the speakers at incendiary public meetings. At present the companies are scattered through the city, occupying ten different buildings as armories, and in some cases not well protected against sudden attack. To guard as much as possible against any disaster from the attempted carrying out of the threats above alluded to, I had district telegraph boxes put in each of the armories with an agreed code of signals to intelligently communicate with Brigade Headquarters by simply turning in any of the signs on the dial of the instrument, each having an understood meaning with reference to such an emergency. Later the armories have been connected with Brigade Headquarters by telephones, so that the Armorer in any of the depots of arms can announce any threatening demonstration or other important fact to the Brigade Commander. These means of communication have been found very serviceable, but there is danger of accidental interruption of communication, and in case of difficulty the wires would soon be severed. Your plan of communication by signals (by disks in the day-time, and by lanterns at night), would, in that event, be invaluable, and I have put the matter of organizing and instructing a Signal Corps in the hands of two efficient and energetic officers, from whom I speedily expect good results. But the great necessity of this locality is a secure and commodious building, specially planned for the needs of the companies and the safe keeping of military property. In such a building, owned by the State and furnished rent free to companies, in place of the present allowance for rents the Armorer of the several companies could defend it against any mob until the arrival of reinforcements, and, by the observance of rigid rules could be secure against an entrance to the building by surprise or strategy.

The buildings known as the Old City Hall and Hall of Records, will soon be abandoned by the city except for use as a police station, and the property in the neighborhood has depreciated so much that a sale of buildings and lots will bring but small returns to the city. There is no doubt that the State can obtain the property on very favorable terms, and perhaps can also obtain the Plaza (Portsmouth Square), as a donation, on the promise to erect a State Arsenal. The plaza is no longer used as a park, and the neighboring property owners would probably be glad to have an arsenal substituted for the present waste space. At some time an arsenal will be an absolute necessity, and if the purchase of a suitable location be long delayed, it will be impossible to secure it at any reasonable price in a convenient locality. The old City Hall site will always be an accessible place for the purpose of a depot of arms, and is more central than any available place that can be named until the city has extended so far to the west and south as to need other secure armories at points quite remote from the present business center. That will be many years hence, and when the increase of population will make a necessity for other arsenals or armories.

The First Regiment of Infantry, Colonel Oscar Woodhams, visited Sacramento in September, 1878, for encampment with the troops of the Fourth Brigade. The regiment was accompanied by the Oakland Guard, Captain H. D. Ranlett, and for the time was attached to the regimental organization, as Company "A." The discipline was good, and the troops were warmly commended. The occasion was one of more than ordinary importance, his Excellency, the Governor and Commander-in-Chief, honoring the troops by reviewing them in the Fair Grounds, in the presence of twenty thousand people. To furnish his Excellency with the proper cavalry escort, it was necessary to transport a company of cavalry from this city at short notice. Captain M. Greany, commanding Company "C," Jackson Dragoons, First Cavalry Battalion, received notice on Monday at one o'clock that such service was desired, and at four o'clock the next day he had forty-two men and horses on the steamer for Sacramento, with full camp outfit, improvised, and at his own expense. I have not been able to fully express my appreciation of this volunteer service on the part of Captain Greany and his company.

And now, General, I wish to return my acknowledgments of the distinguished courtesy with which I have been treated by his Excellency, the Governor and Commander-in-Chief, and by yourself, during the three and a half years of our official connection. I am sure I voice the opinion of the whole National Guard of California when I say that the organization has had no better or more courteous friends in the offices of Governor and Adjutant-General.

I have the honor to be, very respectfully, your obedient servant,

JOHN McCOMB,
Brigadier-General, Commanding Second Brigade, N. G. C.

HEADQUARTERS FOURTH BRIGADE, NATIONAL GUARD, }
SACRAMENTO, July 18th, 1879. }

Brigadier-General P. F. Walsh, Adjutant-General, California :

GENERAL: I have the honor to submit the following report of the condition of the Fourth Brigade, N. G. C. :

I assumed command of this brigade December 30th, 1878. My entire command consists of five companies comprising the First Battalion of Infantry, under command of Lieutenant-Colonel Creed Haymond, and one unattached company, the Sacramento Light Artillery.

Since Lieutenant-Colonel Haymond has assumed command of the First Battalion of Infantry, there has been much improvement in discipline and drill, and it is with pleasure that I commend the example of Colonel Haymond as one worthy of emulation by all officers.

The rifle practice, under the inspection of Major Wallace, has been fair, and will compare favorably with any in the State.

It is but just to repeat the former complaints with regard to the very poor condition of the guns of the Sacramento Light Artillery. These arms are perfectly useless in action, and I would beg of you to use all endeavors to have this company provided with suitable arms.

The Sacramento Hussars, an independent company of excellent soldiers, have an application on file at General Headquarters to be admitted in the National Guard. I earnestly recommend and urge that this company be mustered into the service of the State. Even now, notwithstanding the fact that the company is independent and not subject to orders from these Headquarters, still, upon any and all occasions, the company has been pleased to obey any orders and hold itself ready at all times to respond to any call.

My command is in good condition, with the exception already mentioned of the arms of the Sacramento Light Artillery.

Very respectfully submitted,

THOMAS J. CLUNIE,
Brigadier-General Commanding Fourth Brigade, N. G. C.

SAN FRANCISCO, February 26th, 1878.

Brigadier-General P. F. Walsh, Adjutant-General, California :

GENERAL: The members of the California Team to represent the State in the inter-State military match at Creedmoor, on the 12th of September, 1877, have the honor to report that the trophy was competed for by teams from the States of Connecticut, New York, New Jersey, and California, and the scores made on behalf of our State not only surpassed those made on behalf of any other State on that occasion, but have never been equalled in any military contest, at any time or in any place.

We feel a just pride that we were able to accomplish this under the many difficulties by which we were surrounded. First, in traveling so far to reach the range where the contest must of necessity be held—3,340 miles. Second, in having but three days for practice on the strange range, and those days presenting meteorological conditions entirely different from the surroundings of the day on which the match was shot. Third, in having the usual illness consequent upon change of climate, affecting nearly one-half the members of the team. The scores are so good, that, perhaps, it is unnecessary to make these statements, but it can easily be seen that the brilliant record would have been made still more magnificent if the Californians had shot under the same advantages as those living in the neighborhood. The Inspector of Rifle Practice of the State of New York has referred to the performance in highly commendatory terms, and the chief ordnance officer of the United States, General S. V. Benét, has alluded to the matter in his report to the Secretary of War.

As you are aware, the number of points possible to be made by each marksman (5 points possible to be made with each shot, and 10 shots at 200 yards, and 10 at 500 yards) figure exactly 100, so that the actual points made give the correct percentage of efficiency. Heretofore, the trophy has been won by 63 and 66 per cent, respectively, by New York and Connecticut, but the fame of the California marksmen caused these States to make extra exertions to find their best rifle shots, and keep them in constant practice, so that they managed to improve 14 per cent., but California's score went even beyond that, and we have the proud satisfaction of point-

ing to 83 per cent. as the record on which "The Soldier of Marathon" was transferred to our care. Our best marksman, Captain Wm. H. Brockhoff, made the unparalleled record of 89 out of the possible 100. Lieutenant Joshua Robertson made 47 out of the possible 50, at 500 yards; and Sergeant C. P. LeBreton, Corporal Charles Nash, Sergeant J. P. Warren, Sergeant Harry Hook, and Captain H. J. Burns made remarkable records. No official list has been furnished us, but the following figures are the counts as signalled from the butts, and verified by comparison with the book of the score-keeper: agreeing also with the semi-official publication in "The National Guardsman," a paper devoted to recording events of that character:

Captain Wm. H. Brockhoff	200 yards—5 4 5 4 4 4 5 5 4 5—45	89
	500 yards—2 5 5 4 3 5 5 5 5 5—44	
Lieutenant Joshua Robertson	200 yards—4 5 3 4 4 3 4 4 5—40	87
	500 yards—5 4 5 5 5 5 5 4 5 4—47	
Sergeant C. P. LeBreton	200 yards—4 5 4 5 4 4 4 4 5—43	87
	500 yards—5 4 4 5 5 5 4 4 5 3—44	
Corporal Chas. Nash	200 yards—4 5 4 4 4 4 4 4 4—41	86
	500 yards—5 4 4 3 5 5 5 4 5—45	
Sergeant John P. Warren	200 yards—4 5 4 5 4 5 5 4 3—43	86
	500 yards—5 4 5 2 3 4 5 5 5—43	
Captain H. J. Burns	200 yards—4 5 4 5 4 5 4 4 4—44	84
	500 yards—2 4 5 3 4 5 5 2 5—40	
Sergeant Harry Hook	200 yards—4 3 3 4 4 5 5 4 5—41	83
	500 yards—4 4 5 5 4 4 4 5 3 4—42	
Joseph W. Maher	200 yards—4 4 5 4 5 4 5 4 4—44	82
	500 yards—5 4 4 2 5 0 5 4 5—38	
E. H. Ladd	200 yards—4 4 4 4 4 4 4 5 4—41	80
	500 yards—R 5 4 4 5 4 4 5 3 5—39	
General John McComb	200 yards—4 4 3 4 4 4 5 4 5—41	79
	500 yards—4 4 3 4 5 4 3 5 4—38	
Louis Barrere	200 yards—2 4 4 4 3 4 3 3 5—37	76
	500 yards—5 4 4 5 2 5 5 2 3 4—39	
William Wright	200 yards—4 3 4 4 4 4 4 4 4—39	76
	500 yards—4 3 3 5 3 3 3 4 5 4—37	
Total		995

The other States made the following scores: New York, 967; Connecticut, 971; New Jersey, 744.

We now deliver the trophy into the custody of the Adjutant-General of California, to be returned to Creedmoor in September, 1878, when we hope another team from California may be enabled to meet the military marksmen of the other States, and again bring "The Soldier of Marathon" to the Pacific Coast. To do this it will be necessary to have State aid in defraying the expenses of the members of the team, as it is unlikely that the necessary amount can be raised again by private subscriptions. Indeed, the sum contributed last year for this expedition did not suffice to meet the actual outlay of the trip. We earnestly suggest that you lay the matter before the Legislature, and recommend an appropriation of \$6,000 to encourage our marksmen by defraying the expenses of a trip to Creedmoor in 1878.

JOHN MCCOMB,
Captain of Team.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS, AND HEADQUARTERS UNIVERSITY CADETS, }
UNIVERSITY OF CALIFORNIA, BERKELEY, CALIFORNIA, July 18th, 1879. }

Brigadier-General P. F. Walsh, Adjutant-General of California, Sacramento, California:

SIR: During the past two years I have been at the University of California as Professor of Military Science and Tactics. I was informed at the outset that the Regents and Faculty had but little sympathy for the department up to that time, but that it was believed that they would give me more support.

I found in the department no records of any value, my predecessor's time being fully occupied in other teaching. I at once began working up what material I could obtain. Finally, after many discouragements, I succeeded in constructing a partially correct record that I have experienced the greatest difficulty in keeping up to date, owing to the totally inadequate means for obtaining information. I found the battalion insubordinate, without detailed instruction, slovenly in all movements. Many seemed to wish better information, but could not be separated from the others.

The time was insufficient—two hours per week. Thus, without one capable assistant, I have had in two hours' time to "set up" and instruct some two hundred and fifty individuals, constantly changing, without discipline, and ruined by a weak system and careless customs, the development of years of adverse policy.

The first thing to be done was to endeavor to form a corps of instructors from among the well disposed, and to encourage a better and more honorable feeling; all had to be done in the two hours. I therefore devoted the remainder of my time largely to the University, in order to meet and talk with students, to build up if possible some pride in the University and in their corps. The authorities of the University have, in all military cases, shown that they consider the individual rather than the effect upon the whole body of students. I began by laying before the Faculty the names of offenders under the old regime. Nothing was done, save to give a caution. I finally laid before them a case of gross insubordination, one requiring the most decided action. The young man was suspended for a half term.

The fact that a large number of the students reside at a distance from the University, while even those living near by are very much scattered, has prevented many outbreaks that would have occurred under so lax a rule if they (the students) were together at all times; but enough has occurred in the past two years to show that a firmer policy is needed. Young men who receive their education from the State should honestly comply with the conditions imposed upon them by the State. Failing to do so they should be coerced or sent away. It seems to me palpable that the duty of the University is to the public, not to the individual. The military department, fostered as is intended by the United States laws and those of California bearing upon the subject, would be of great service in dealing with students.

Convinced that the public should be better informed as to the discipline of the University and as to my department, I requested the Board of Regents to appoint a day for a military display, and made every effort to incite the students to do their best. I will say for them that those who were present really did their best. In so doing they unconsciously betrayed the defective system of control. As you were an eye-witness to their lack of soldierly bearing and discipline as a corps, further comment is unnecessary. It but remains for me to state that I deem it essential to the future of the military department here, to request such further legislation as shall make it binding upon the University to adopt at once a code of regulations which shall enable the military professor to properly carry out his instruction in the closet and in the field—so binding that the ill-will or convictions of the Faculty can do but little towards assisting the students in evading the requirements of the present and future laws. The time allotted to drill and military studies is insufficient. It should be increased greatly.

Students physically unable to drill should pay some definite sum, over and above the school taxes, towards the support of the University, or show that they and their friends are unable to do so. In the latter event, they should aid in the office work, in the armory, etc. This, after their disability has been established by a Board of Surgeons, appointed from the medical faculty. Able-bodied students failing to attend drill, or having the maximum number of demerit marks, given according to a carefully prepared scale, should be dismissed. Those having seventy-five per cent. should be suspended for a year; those having fifty per cent., for one term. Mutinous conduct should be punished by expulsion. This should also be the penalty for conduct unbecoming officers and gentlemen. Students expelled, dismissed, or suspended, should by law not be allowed on the University grounds.

All this is necessary, as it is impossible to inflict the punishments at an institution where the students do not occupy barracks but live at a distance, and where the organization is not that of a military academy.

It would be well, if practicable, to provide by law for a yearly encampment, to take place during the time now devoted to one of the minor holidays.

The lack of income is given as a reason for not supplying the military department with many essentials. I therefore have the honor to recommend that the Legislature be urged to appropriate \$10,000 for an armory, furniture, and other requisites, together with a yearly support of not over \$1,000 for keeping the same in order, the pay of an instructor of music, and other incidental expenses, not to include the hire of an Armorer, who should be paid by the University. The said incidentals to include books, maps, apparatus, instruments, etc., that may become necessary. This sum should be accounted for and audited as is the case with other University money. The above, only if means be provided by law to carry out the spirit of the laws now extant.

The University is now supplied by the United States with 200 Springfield breech-loading rifles, cadet pattern, belts, belt plates, cartridge boxes, and bayonet scabbards (steel). Also, with two field pieces, 3" rifle, their caissons and implements. In addition, it receives a yearly allowance of 100 rounds blank cartridges (cannon), 300 friction primers, 1,000 ball, and 1,000 blank metallic cartridges.

I wrote to the Regents of the University June 8th, 1879, informing them that it would be useless for me to remain longer at Berkeley unless changes were made in the methods of dealing with students, and greater support and authority given to the military department—sufficient weight, in brief, to enable me to do myself justice.

I have, up to the present time, heard nothing from them, and this day forward to the Adjutant-General, U. S. Army, an application to be relieved from duty here.

Very respectfully, your obedient servant,

G. G. GREENOUGH,

First Lieutenant Fourth U. S. Artillery, Professor Military Science and Tactics.

FORT CANBY, W. T., September 13th, 1879.

Brigadier-General P. F. Walsh, Adjutant-General of California, Sacramento, California:

SIR: In preparing my report, dated Department of Military Science and Headquarters University Cadets, University of California, July 18th, 1879, I wished to be as concise as practicable, knowing that in previous years you had been limited as to space in making up your own report. Therefore I confined myself to the report proper. As it seems that the paper may be misconstrued, I write to say that my report is simply upon the system pursued at the University of California as it affects the Military Department, and is not intended as an attack upon individuals or their motives.

I believe that the Board of Regents, in their dealings with the department, have faithfully endeavored to reconcile the University system, as developed by the Faculty, with the military. They deal rather with the general interests, with matters not within the province of the Faculty, and interfere rarely with the latter body in matters pertaining to discipline. The Faculty assume control in such things, and are responsible for the results.

I recognize the difficulty of incorporating a military course with the ordinary instruction at Universities. Without such a course the discipline at the University of California might suffice, for aught I know. With one, it is totally insufficient. The problem is not an easy one for the University to solve. That it has not been solved to my satisfaction does not alter my regard for the Regents or Faculty, among both of whom I have warm friends.

I will conclude by referring to the students, towards whom I entertain the kindest feelings. I speak in my report of their appearance as a body under arms. It is a result of the faulty system. Many, if not all of the young men, *individually*, are all that can be desired. I shall be glad to number them always among my friends.

Thanking you for the able assistance and support you gave me while at the University, as well as for the uniform courtesy I have met with at your hands,

I am, very respectfully, your obedient servant,

G. G. GREENOUGH,

First Lieutenant Fourth United States Artillery, late Professor of Military Science, etc., University of California.

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EIGHTH BIENNIAL REPORT

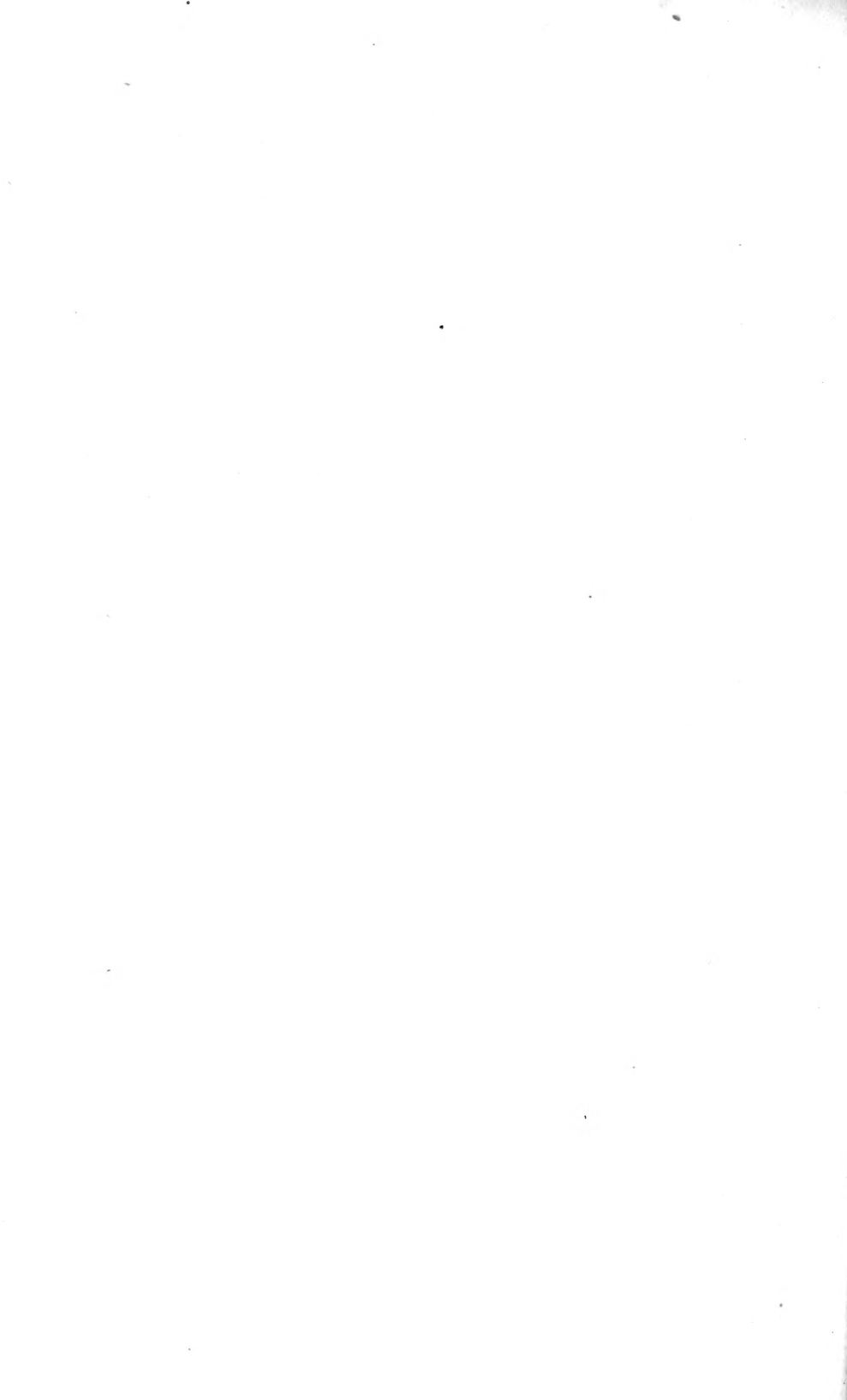
OF THE

TRUSTEES OF THE STATE LIBRARY

FOR THE

29TH AND 30TH FISCAL YEARS,

Beginning July 1st, 1877, and ending June 30th, 1879.



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REPORT.

CALIFORNIA STATE LIBRARY,
SACRAMENTO, December 8th, 1879. }

To His Excellency, William Irwin, Governor of California:

SIR: I have the honor to transmit herewith the eighth biennial report of the Trustees of the State Library.

Very respectfully, your obedient servant,

ROBERT O. CRAVENS,
Librarian, and Secretary of the Board of Trustees.

REPORT OF THE TRUSTEES OF THE STATE LIBRARY.

STATE LIBRARY, December 8th, 1879.

To His Excellency, William Irwin, Governor of California:

The Trustees of the State Library respectfully present their eighth biennial report:

At the close of the fiscal year ending June 30th, 1877, the number of volumes in the Library was 45,478, of which there were in the General Library, 31,917; in the Law Library, 13,561.

At the close of the fiscal year ending June 30th, 1879, there was 49,159. In the General Library, 34,398; in the Law Library, 14,761. Total additions from June 30th, 1877, to June 30th, 1879, 3,681.

The ordinary increase of the Library has been fully maintained during the past two years. It is believed that the character of the books added has been superior to that of former years, a larger proportion being standard works of permanent value.

LAW LIBRARY.

The works in this department of the Library are in constant use in the Courts, by State officers, members of the bar, and the Legislature. Many valuable additions have been made. It is as nearly complete for the uses of the jurist, the statesman, or lawyer, as any library in the United States.

JOHN W. ARMSTRONG,
FREDERICK COX,
F. W. HATCH,
E. W. MASLIN,
JO HAMILTON.

Trustees.

STATEMENT

*Showing in detail the expenditures from the Library Fund during the 29th and 30th fiscal years,
from July 1st, 1877, to June 30th, 1879.*

1877.	Books.		
October 29—Soule, Thomas & Wentworth		\$38 40	
October 29—Ward & Peloubet		70 69	
October 29—William Wood & Company		109 56	
October 29—D. Van Nostrand		838 00	
October 29—Little, Brown & Company		136 98	
J. W. Bouton		253 10	
Currency		\$1,446 73	Gold, \$1,418 44
October 29—George I. Lytle		\$23 10	
October 29—E. F. Haswell		75	
October 29—E. Ellis		3 00	
October 29—C. E. Spencer		9 75	
October 29—W. T. Grissim		9 50	
October 29—Charles A. Sumner		3 00	
October 29—W. D. Barton		1 50	
October 29—E. M. Sleator		10 00	
October 29—Payot, Upham & Company		102 50	
October 29—Dewey & Company		10 00	
October 29—A. Roman & Company		428 02	
December 5—A. L. Bancroft & Company		\$60 00	601 12
December 5—E. M. Sleator		34 50	
			94 50
1878.			
February 22—R. O. Cravens		\$108 54	
February 22—Dewey & Company		10 00	
February 22—A. Roman & Company		507 11	
February 22—H. Still		36 50	
February 22—George I. Lytle		14 65	
February 22—Daily Bulletin		2 00	
February 22—H. S. Crocker & Company		3 00	
February 22—Homer Hawley & Company		10 40	
February 22—C. C. Hall		10 00	
February 22—J. A. Filcher & Company		4 00	
February 22—San Francisco News-Letter		5 00	
February 22—L. P. McCarty		2 50	
February 22—Henry Keller & Company		80 00	
February 22—C. E. Spencer		16 25	
February 22—William Halley		14 25	
February 22—G. H. Holton		12 00	
February 22—C. H. Holton		2 60	
			838 80
February 22—William Wood & Company		10 00	
February 22—Thompson & Stevenson		5 00	
February 22—Ward & Peloubet		70 80	
February 22—MacMillan & Company		4 00	
February 22—W. H. & O. H. Morrison		27 00	
February 22—David A. Gorton		4 00	
February 22—J. W. Bouton		10 00	
February 22—H. O. Houghton & Company		5 00	
February 22—North American Review		5 00	
February 22—D. Van Nostrand		260 04	
February 22—Soule, Thomas & Wentworth		57 75	
Currency		\$478 59	Gold, 473 81
May 6—Sumner, Whitney & Company			302 10
August 6—C. H. Holton		\$3 90	
August 6—C. E. Spencer		19 50	
August 6—H. C. Megerle		445 00	
August 6—G. I. Lytle		29 70	
			57 55
Amount carried forward			\$3,786 32

Books—Continued.

Amount brought forward.....		\$3,786 32
August 6—L. M. McKeuney.....	\$2 00	
August 6—J. P. Collier.....	9 50	
August 6—A. L. Baneroff & Company.....	11 00	
August 6—Dewey & Company.....	10 00	
August 6—D. M. Moyer.....	12 50	
August 6—P. F. Collier.....	3 50	
August 6—H. Still.....	61 50	
August 6—R. R. Parkinson.....	8 00	
August 6—Snow & May.....	7 50	
August 6—L. P. McCarty.....	4 00	
August 6—A. Roman & Company.....	231 15	
		360 65
August 6—H. C. Lea.....	\$6 00	
August 6—Little, Brown & Company.....	318 80	
August 6—Kay & Brother.....	25 00	
August 6—Ward & Peloubet.....	35 78	
August 6—F. H. Thomas & Company.....	5 75	
August 6—William Wood & Company.....	117 33	
August 6—G. I. Jones & Company.....	5 00	
August 6—Baker, Voorhies & Company.....	5 75	
August 6—Houghton, Osgood & Company.....	5 00	
August 6—American News Company.....	3 00	
August 6—Publishers' Weekly.....	6 00	
August 6—D. Van Nostrand.....	443 93	
August 7—Library Journal.....	10 00	
		987 34
September 3—Payot, Upham & Company.....	\$10 12	
September 3—A. Roman & Company.....	90 68	
September 3—F. H. Thomas & Company.....	247 00	
September 3—D. Van Nostrand.....	293 07	
September 3—Robert Clarke & Company.....	135 03	
September 3—George I. Lytle.....	6 00	
		881 90
October 9—G. I. Lytle.....	\$19 35	
October 9—Sumner, Whitney & Company.....	290 05	
October 9—A. L. Baneroff & Company.....	22 00	
October 9—A. Roman & Company.....	25 96	
October 9—William Cushing.....	2 59	
October 9—Weed, Parsons & Company.....	13 00	
October 9—Ward & Peloubet.....	6 82	
October 9—D. Van Nostrand.....	12 54	
October 9—William Wood & Company.....	73 40	
October 9—Robert Clarke & Company.....	111 94	
		577 65
December 3—F. A. Scofield.....	\$6 00	
December 3—P. M. Megerle.....	3 90	
December 3—C. H. Holton.....	2 60	
December 3—George I. Lytle.....	7 50	
December 3—W. T. Baggett.....	6 59	
December 3—H. Still.....	58 00	
December 3—Sumner, Whitney & Company.....	142 00	
December 3—Payot, Upham & Company.....	184 80	
December 3—A. Roman & Company.....	1,308 35	
		1,719 65
December 3—William Wood & Company.....	\$16 00	
December 3—American Journal of Insanity.....	15 00	
December 3—Robert Clarke & Company.....	8 30	
December 3—F. H. Thomas & Company.....	214 25	
December 3—D. Van Nostrand.....	563 08	
December 3—North American Review.....	5 00	
December 3—American Catalogue.....	2 50	
December 3—Little, Brown & Company.....	5 00	
December 3—Ward & Peloubet.....	38 74	
		867 87
1879.		
March 1—A. Roman & Company.....	\$700 00	
May 5—Sumner, Whitney & Company.....	300 00	
		1,000 00
Amount carried forward.....		\$10,181 38

Books—Continued.

Amount brought forward.....		\$10,181 38
May 21—G. I. Lytle.....	\$23 70	
May 21—C. E. Spencer.....	39 00	
May 21—H. C. Megerle.....	3 90	
May 21—C. H. Holton.....	2 60	
May 21—G. H. Holton.....	12 00	
May 21—H. Still.....	72 00	
May 21—W. A. & C. S. Houghton.....	4 35	
May 21—J. B. Stovall.....	2 50	
May 21—Dewey & Company.....	10 00	
May 21—F. Marriot.....	5 00	
May 21—Argonaut Publishing Company.....	20 00	
May 21—Michael Flood.....	25 00	
May 21—E. M. Sleator.....	27 00	
May 21—Payot, Upham & Company.....	12 60	
May 21—R. O. Cravens.....	30 00	
May 21—W. H. Holmes.....	123 00	
May 21—C. E. Spencer.....	7 50	
May 21—Central Law Journal.....	5 00	
May 21—G. I. Jones.....	5 00	
May 21—F. H. Thomas & Company.....	13 25	
May 21—Robert Clarke & Company.....	99 49	
May 21—Publishers' Weekly.....	6 40	
May 21—American Catalogue.....	2 71	
May 21—J. W. Bouton.....	64 92	
May 21—William Wood & Company.....	3 00	
May 21—N. C. Lea.....	6 00	
May 21—Houghton, Osgood & Company.....	5 00	
May 21—Little, Brown & Company.....	54 50	
May 21—D. Van Nostrand.....	666 62	
		1,352 04
June 30—A. L. Bancroft & Company.....	4 06	
June 30—Sumner, Whitney & Company.....	51 25	
June 30—J. N. Choynski.....	5 00	
June 30—A. Roman & Company.....	390 25	
June 30—L. M. McKenny.....	3 00	
June 30—C. H. Holton.....	2 60	
June 30—F. H. Thomas.....	5 30	
June 30—D. Van Nostrand.....	16 73	
June 30—North American Review.....	1 00	
June 30—A. C. Armstrong & Company.....	2 71	
June 30—Central Law Journal.....	50	
June 30—William Wood & Company.....	69 32	
		551 72
June 30—George I. Lytle.....	\$11 85	
June 30—National Quarterly Review.....	4 00	
		15 85
		<u>\$12,100 99</u>

INSURANCE—1877-8.

North British and Mercantile Insurance Company.....	\$70 00	
Union Insurance Company.....	70 00	
Ætna Insurance Company.....	35 00	
Girard Insurance Company.....	35 00	
		\$210 00
London Assurance Company.....	\$35 00	
London, Liverpool and Globe Insurance Company.....	35 00	
Hartford Insurance Company.....	35 00	
Commercial Insurance Company.....	35 00	
Firemen's Fund Insurance Company.....	35 00	
		175 00
1878-9.		
Home Mutual Insurance Company.....	\$70 00	
Union Insurance Company.....	70 00	
North British and Mercantile Insurance Company.....	70 00	
Ætna Insurance Company.....	35 00	
Girard Insurance Company.....	35 00	
		280 00
Amount carried forward.....		\$665 00

INSURANCE—Continued.

Amount brought forward.....		\$665 00
Phoenix and Home Insurance Company (joint policy).....	\$35 00	
London, Liverpool and Globe Insurance Company.....	35 00	
Hartford Insurance Company.....	35 00	
Firemen's Fund Insurance Company.....	35 00	
Commercial Insurance Company.....	35 00	
		175 00
1879-80.		
Home Mutual Insurance Company.....		70 00
		<u>\$910 00</u>

1877.

FREIGHT AND CARTAGE.

October 29—S. Kingsbury.....	\$7 00	
October 29—Central Pacific Railroad Company.....	67 27	
December 5—Wells, Fargo & Company.....	9 30	
		\$83 57
1878.		
February 22—S. Kingsbury.....	\$4 00	
February 22—Central Pacific Railroad Company.....	53 10	
February 22—Geo. Julian Harvey.....	6 25	
August 6—Central Pacific Railroad Company.....	62 33	
August 6—S. Kingsbury.....	3 00	
August 6—J. Duffy.....	1 50	
August 6—John Perry.....	1 00	
September 3—Central Pacific Railroad Company.....	30 89	
September 3—S. Kingsbury.....	2 00	
December 3—S. Kingsbury.....	7 50	
December 3—Central Pacific Railroad Company.....	141 69	
		313 26
1879.		
May 1—John A. Lafferty.....	\$2 00	
May 1—Central Pacific Railroad Company.....	71 60	
June 30—S. Kingsbury.....	4 00	
		77 60
		<u>\$474 43</u>

1877.

DISCOUNT ON SILVER AND PREMIUM ON EXCHANGE.

October 29—Discount.....	\$54 82	
1878.		
February 22—Discount and exchange.....	30 90	
August 6—Discount and exchange.....	17 15	
September 3—Discount.....	10 00	
October 9—Discount and exchange.....	8 25	
December 3—Discount and exchange.....	30 90	
1879.		
March 1—Discount.....	7 20	
May 21—Discount and exchange.....	15 93	
June 30—Discount and exchange.....	2 12	
		\$177 27

1877.

BINDING.

October 29—F. Foster.....	\$179 50	
1878.		
February 22—F. Foster.....	231 75	
October 9—F. Foster.....	277 75	
1879.		
May 1—F. Foster.....	1,083 50	
		\$1,792 50

1877.

ICE.

October 9—Pacific Ice Company.....	\$14 10	
December 9—Pacific Ice Company.....	7 95	
1878.		
February 22—Pacific Ice Company.....	7 95	
August 6—Pacific Ice Company.....	23 10	
September 3—Pacific Ice Company.....	4 05	
October 9—Pacific Ice Company.....	3 75	
December 3—Pacific Ice Company.....	7 95	

Amount carried forward..... \$68 85

Ice—Continued.

Amount brought forward	68 85	
1879.		
May 24—Pacific Ice Company	16 61	
June 30—Pacific Ice Company	6 75	
June 30—Pacific Ice Company	6 25	
		<u>\$98 46</u>

1877.

MISCELLANEOUS.

October 29—Rothfeld Brothers, towels		\$5 00
December 5—A. Flohr, repair of locks	\$12 25	
December 5—M. S. Hammer, soap	7 60	
December 5—E. Lyon & Company, towels	5 00	
December 5—A. T. Nelson, leather straps	1 50	
December 5—A. Hathaway, cleaning carpets	83 70	
December 5—W. F. Brown, cleaning library	46 75	
December 5—J. C. McDonald, cleaning library	74 25	
December 5—Jas. Glennan, cleaning library	126 50	
December 5—T. H. Wallace, cleaning library	50 00	
December 5—H. S. Crocker & Company, paper	3 75	
December 5—R. R. Patton, work	37 50	
December 5—Locke & Lavenson, carpet lining	7 50	
		<u>456 30</u>

1878.

May 6—L. L. Lewis & Company, mouse traps	\$1 00	
May 6—Bullard & Loftus, repair of door and lock	18 50	
May 6—J. C. Murphy, stamp and ink	7 50	
May 6—Sam Drummond, cleaning shelves	8 00	
May 6—Laufkötter Brothers, repair of heater	3 52	
May 6—John Voorhies, map rack	30 00	
		<u>68 52</u>
September 3—Locke & Lavenson, dusters, etc.	\$23 50	
September 3—C. W. Rapp, soap	2 25	
		<u>25 75</u>

October 9—Rothfeld Brothers, towels, etc.	\$15 50	
October 9—Locke & Lavenson, draping picture	2 00	
October 9—P. H. Russell, soap, etc.	1 50	
October 9—H. C. Patrick, rat poison	25	
October 9—W. A. Gett, Jr., cleaning books and shelves	68 00	
October 9—E. Dully, cleaning books and shelves	85 00	
October 9—John Voorhies, repairing, chairs, tables, etc.	26 00	
October 9—A. Flohr, repairing lock	8 25	
October 9—C. Krieger, desk	100 00	
October 9—Brown & Brothers, crowbar and nail-lifter	4 25	
October 9—Sumner, Whitney & Company, book-cases	60 00	
October 9—W. B. Maydwell, paper files	3 45	
October 9—H. Wachhorst, clock	10 00	
October 9—P. H. Russell, soap	80	
		<u>385 00</u>

1879.

May 21—W. F. Brown, dusting, etc.	\$126 00	
May 21—L. L. Lewis & Company, repairing water filter	6 00	
		<u>132 00</u>
		<u>\$1,072 57</u>

RECAPITULATION.

Total amount of warrants drawn		\$16,645 52
By insurance	\$910 00	
By books	12,100 99	
By discount and exchange	177 27	
By binding	1,792 50	
By freight, cartage, etc.	474 43	
By ice	98 46	
By miscellaneous	1,072 57	
		<u>16,626 22</u>
Amount unexpended		<u>\$19 30</u>

STATEMENT

Showing the condition of the State Library Fund, from June 30th, 1877, to June 30th, 1879.

CREDIT.

July 1, 1877—By balance forward	\$1,341 08	
June 29, 1878—By fees from office of Secretary of State	11,632 00	
June 30, 1879—By fees from office of Secretary of State	10,853 75	
		<u>\$23,826 83</u>

DEBIT.

June 30, 1878—To warrants issued	\$5,287 63	
June 30, 1879—To warrants issued	11,537 89	
To balance	7,181 31	
		<u>\$23,826 83</u>
July 1, 1879—By balance		\$7,181 31

STATEMENT

Showing how the appropriation for postage and expressage for 29th and 30th fiscal years has been expended, from July 1st, 1877, to June 30th, 1879.

Appropriation for 29th fiscal year	\$200	
Appropriation for 30th fiscal year	200	
		<u>\$400 00</u>

29TH FISCAL YEAR.

November, 1877—Wells, Fargo & Company, expressage	\$15 90
Postage stamps and Post-office rent	100 00
February 1, 1878—Wells, Fargo & Company, expressage	50 40

30TH FISCAL YEAR.

July, 1878—W. C. Hopping, stamps	25 00	
Wells, Fargo & Company, expressage (29th fiscal year)	29 60	
March, 1879—Post-office stamps	20 00	
Balance	159 10	
		<u>\$400 00</u>
Balance unexpended		\$159 10

STATE OF CALIFORNIA, }
County of Sacramento, } ss.

I, R. O. Cravens, Secretary of the Board of Trustees of the State Library, do solemnly swear that the foregoing is a true and correct statement of expenditures for the State Library for the 29th and 30th fiscal years, from July 1st, 1877, to June 30th, 1879.

R. O. CRAVENS.

Subscribed and sworn to before me, this 8th day of December, 1879.

[SEAL.]

D. B. WOOLF, Clerk.
By JOHN P. POOLE, Deputy.

BOOKS AND PAMPHLETS

Received in exchange, donations from other States and countries, and from individuals.

Donor.	Title.
Alabama	Reports, Vols. 48, 49, 51, 52, 56. Code, 1876. Session Law, 1876-7, 1877-9. Report of Geological Survey, 1876. Journal of Constitutional Convention, 1875. Journal of Legislative Assembly, 1877.
Arizona	Session Laws, 1877. Compiled Laws, 1877.
Arkansas	Session Laws, 1876, 1879.
Colorado	Reports, Vol. 30. Civil Code, 1877. General Laws, 1877.
Connecticut	Reports, Vols. 43, 44. Colonial Records, 1751 to 1757. Public Acts, 1877, 1878, 1879. Special Acts, 1877, 1878. Private Laws, 1878, 1879.
Dakota	Revised Statutes, 1877.
Delaware	Reports, Vol. 1. Chancery Reports, Vols. 1 and 2.
Florida	Laws, 1877. Reports, Vol. 16. Session Laws, 1879.
Georgia	Senate and Assembly Journals, 1879. Senate and House Journals, 1877. Laws, 1877. Journal of Constitutional Convention, 1877. Constitution, 1877. Reports, Vols. 57 and 58.
Illinois	Reports, Vols. 81, 82, 83, 84, 85, and 86. History of, by Hon. Minian Edwards, with Life of the Author. Laws, 1877. Railroad and Warehouse Commissioners Report, 1877. Canal Commissioners Official Report, 1875-6. Senate and House Journal, 1877. Official Reports, 1877. Compiled School Law, 1872 to 1877. Revenue Law (Auditor's edition), 1877. Report of State Board of Equalization, 1878.
Iowa	Reports, Vols. 43, 44, 45, 46, and 47. Laws, 1878. Senate and House Journal, 1878. Documents, 1878.
Kansas	Reports, Vols. 17, 18, 19, and 20. Directory of State Government, 1877. School Laws, 1877. Agricultural Report, 1876. Horticultural Society's Report, 1877.
Kentucky	Reports (Bush), Vol. 13. Agricultural Reports, 1878.
Louisiana	Annual Reports, Vols. 27, 28, 29, and 30. Laws, 1877, 1878, 1879. Documents, 1878. Senate and House Journals, 1878 and 1879. State Library Catalogue, 1878.
Maine	Reports, Vols. 66 and 67. Senate and House Journals, 1876. Agricultural Report, 1876-7. Acts and Resolves, 1877 and 1878. Legislative Public Documents, 1877.
Maryland	Reports, Vol. 45. Laws, 1878. Senate and House Journal, 1878.

BOOKS AND PAMPHLETS—Continued.

Donor.	Title.
Maryland -----	Documents, 1878. Burgwin's Digest.
Massachusetts -----	Census Reports, 1875, Vols. 2 and 3. Reports, Vols. 121, 122, 124, and 125. Special Laws, 1871-1875. Acts and Resolves of Massachusetts Bay, 1692-1741. Public Documents, 1876, 1877. General Laws and Resolutions, 1877. Constitution. Public Charities' Report made to the Massachusetts Centennial Commission, 1876. Report of Bureau of Statistics and Labor, 1877. Ninth Annual Report of State Board of Health, 1878. General Laws, 1878. Report of Tax Commission, 1875. Acts and Resolves, 1878.
Michigan -----	Reports, Vols. 34, 35, and 36. Public Acts, 1877. Report State Librarian, 1877-8. History of the Press of Michigan. Chart and Key to Educational System. Illuminating Oils of Michigan. Restriction and Prevention of Scarlet Fever. Flags of Michigan. Report of Centennial Managers. Geological Survey. Legislative Manual, 1877. Index to Laws, 1872-77. Pioneer Collections.
Minnesota -----	Reports, Vol. 23.
Mississippi -----	Senate and House Journal, 1878. Reports, Vols. 54 and 55.
Missouri -----	Laws, 1877. Reports, Vols. 65 and 66.
Montaña -----	Laws, 1877 and 1879.
Nebraska -----	Laws, 1877. Senate and House Journal, 1877. Maxwell's Digest. Reports, Vols. 6 and 7.
Nevada -----	Reports of State Mineralogist, 1869, '70, '71, '72, '75-6. Senate and House Journals, 1877. Appendix to Journal, 1877. Statutes, 1877. Reports, Vol. 12.
New Hampshire -----	Reports, Vols. 55, 56, and 57. Senate and House Journal, 1876, 1877, and 1878. Reports to Legislature, 1876, 1877, and 1878. Session Laws, 1876 and 1877. Hitchcock's Geological Survey, Vols. 2 and 3. General Laws (with Constitution and Index), 1878.
New Jersey -----	Law Reports, Vol. 39. Equity Reports, Vols. 27, 28, and 29. Stewart's New Jersey Digest, Vols. 1 and 2. Laws, 1877 and 1878. Senate Journal, 1877 and 1878. Minutes of Assembly, 1877 and 1878. Hood's Index to New Jersey Laws, 1663-1877. Geological Report on Clays, 1878. Legislative Documents, 1877, 1878. Revised Laws, 1709 to 1877.
New Mexico -----	Council Journal, 1878. House Journal, 1878. Laws, 1878.
New York -----	Court of Appeal's Reports, Vols. 65, 66, 67, 68, 69, 70, 71, and 72. Supreme Court Reports, Vols. 17, 18, 19, 20, 21, 22, and 23. Laws, 1877, 1878.

BOOKS AND PAMPHLETS—Continued.

DONOR.	Title.
New York	Code and Civil Procedure, 1877.
	Senate Documents, 1875, Vol. 6.
	Senate Documents, 1876, Vols. 3 and 4.
	Assembly Documents, 1876, Vols. 5 to 8.
	The 80th, 90th, and 91st Annual Report of Regents of University, 1876-1878.
	State Library Reports, 1877.
	Report of Commission on Government of Cities.
	Journals of Senate and Assembly, 100th Session, 1877.
	Journals of Senate and Assembly, 101st Session, 1878.
	Senate and Assembly Documents, 100th Session, 1877.
	Senate and Assembly Documents, 101st Session, 1878.
	Report of Proceedings of Legislature, on the Removal from Old to New Capitol.
	Colonial History of New York, Vol. 12.
	Annual Report State Treasurer, 1877.
North Carolina	Senate and House Journal, 1876, 1877.
	Executive Documents, 1876 and 1877.
	Laws, 1876 and 1877.
	Reports, Vols. 76, 77, 78, and 79.
Ohio	Executive Documents, 1876, 1878.
	House and Senate Journal, 1876, 1877.
	Railroad Report, 1876.
	Statistics, 1876, 1877.
	Common School Reports, 1876.
	Agricultural Reports, 1876 and 1877.
	Laws, 1877, 1878.
	Report of Centennial Managers, 1877.
	Senate Journal, 1878.
	State Report, 28, 30, and 31.
Oregon	Reports, Vol. 6.
Pennsylvania	Laws, 1877.
	Senate and House Journal, 1877.
	Legislative Documents, 1877, 3 vols.
	Executive Documents, 1876.
	Fire and Life Insurance Reports, 1876.
	Smull's Legislative Hand-Book.
	State Reports, Vols. 81, 82, 83, 84, and 85.
Rhode Island	Reports, Vol. 11.
	Acts and Resolves, May Session, 1876.
	Acts and Resolves, January Session, 1877.
	Acts and Resolves, May Session, 1877.
	Acts and Resolves, January Session, 1878.
	Acts and Resolves, May Session, 1878.
	Acts and Resolves, May Session, 1879.
	General Index to Reports.
South Carolina	Senate and House Journals, 1877, 1878.
	Acts, Regular Sessions, 1877, 1878.
	Reports and Resolutions, 1878.
	Richardson's (S. C.) Reports, Vols. 6 and 8.
Tennessee	Senate and House Journal, 1877.
	Senate Appendix, 1877.
	Laws, 1877.
	Heiskell's Tennessee Reports, Vols. 9, 10, 11, and 12.
	Lea's Tennessee Reports, Vol. 1.
	Journal of Constitutional Convention, 1870.
Texas	Reports, Vols. 45, 46, 47, and 48.
	Reports, Court of Appeals, Vols. 3 and 4.
Vermont	Reports, Vol. 49.
	Governor and Council, Vol. 5.
	Robert's (Vermont) Digest.
Virginia	Grattan's Reports, Vols. 26, 27, and 28.
	Senate and House Journal, 1877-8.
	Annual Reports, 1877.
	Laws, 1877-8.
	Railroad Commissioner's Report, 1877.

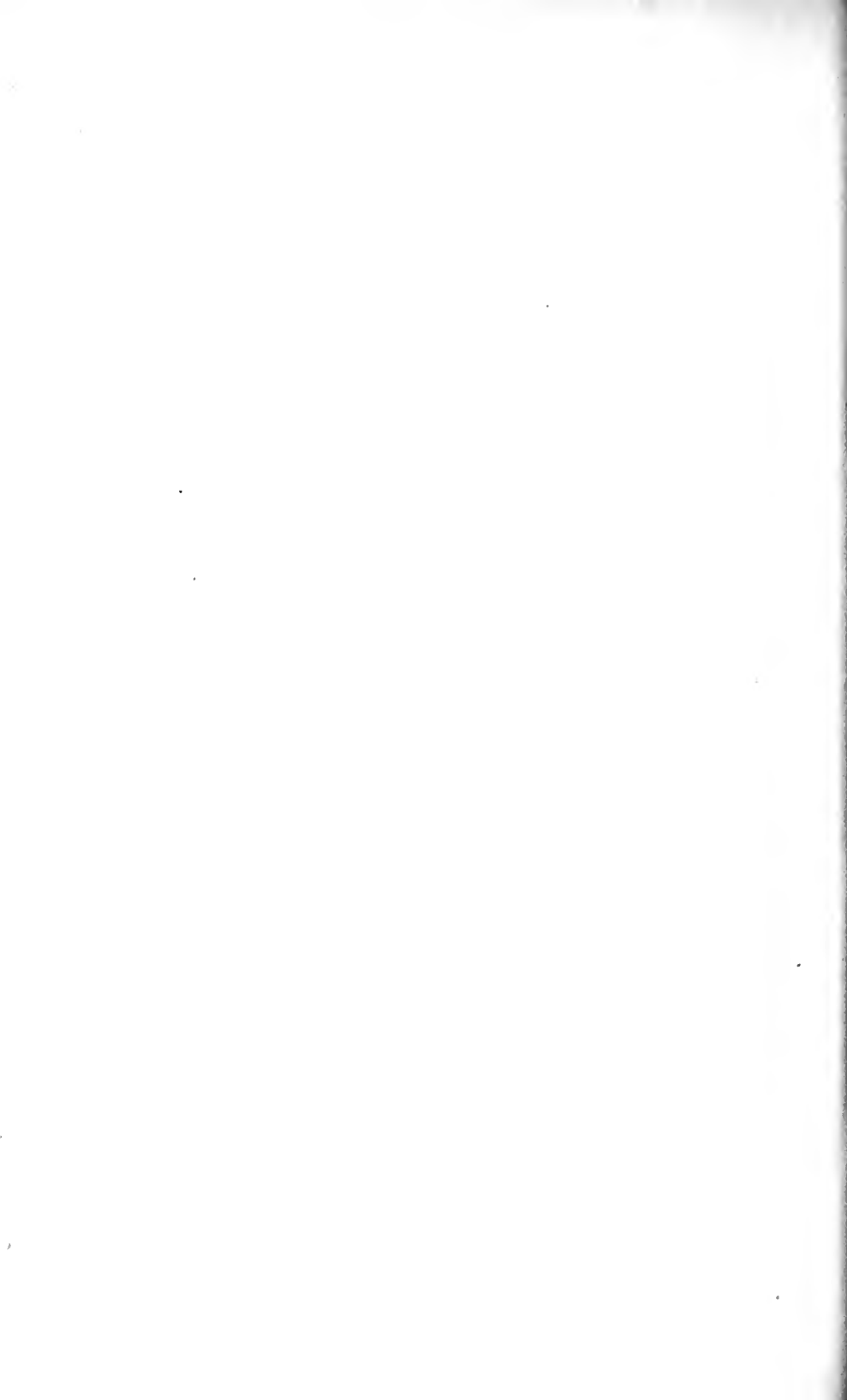
BOOKS AND PAMPHLETS—Continued.

DONOR.	Title.
Washington	Laws, 1877.
	School Laws, 1877.
	Road Laws, 1877.
	Election Laws, 1877.
	House Journal, 1877.
West Virginia	Evans on Wealth and Resources of Washington Territory.
	Reports, Vols. 9, 10, 11, and 12.
Wisconsin	Laws, 1879.
	Reports, Vols. 42, 43, 44, and 45.
	Laws, 1878 and 1879.
	Senate and Assembly Journals, 1878, 1879.
Wyoming	Message and Documents, 1878, 1879.
	Revised Statutes, 1878.
	Laws, 1877.
United States	Council and House Journal, 1877.
	Reports, Vol. 1.
	Patent Office Plans and Specifications, May, 1877, to February, 1879.
	Patent Office Gazette, June, 1877, to June, 1879.
	Poor's Federal Constitution, 2 vols.
	Congressional Documents, 2d Session, 44th Congress, 1876-7.
	Congressional Documents, 1st Session, 45th Congress.
	Congressional Documents, 2d Session, 45th Congress.
	Statutes, 1st Session, 45th Congress.
	Statutes, 2d Session, 45th Congress.
	Statutes, 3d Session, 45th Congress.
	Clarence King's Geological Report, Vols. 1, 2, 4, and 6.
	Powell's Reports on Geology of Uintah Mountains.
	Powell's Reports on Geology of Rocky Mountains, Vol. 1.
	Hayden's Report on United States Survey of Territories, Vols. 2, 7, 9, 10, 11.
	Annual Report of Survey of Colorado, etc., 1873-4.
	Fur-bearing Animals, etc.
	Cous' Birds of Northwest.
	Ethnology of Hidasta Indians.
	Astronomy and Barometric Hypsometry, Vol. 2.
	Wheeler's Geological Survey West of 100th Meridian, Vol. 4.
	Atlas of Geological Exploration, 40th Parallel.
Melbourne Public Library	War Maps, 5 sheets:
	1. Atlanta Campaign; 2. Operations in front of Atlanta; 3. Operations about Chattanooga; 4. Operations about Franklin; 5. Operations about Knoxville; 6. Marches of United States troops under General Sherman.
	Smithsonian Institute Annual Reports, 1875-6-7.
	Smithsonian Institute Collections, Vols. 13, 14, 15.
	Smithsonian Institute Contributions to Knowledge.
	Astronomical Observations at United States Observatory, 1875.
	Statutes of Victoria, 1874.
	Report of the Commissioner of Victoria to the International Exhibition at Philadelphia, 1876.
	Mueller's Observations on New Vegetable Fossils of the Auriferous Drifts.
	Victoria Year-Book, 1876-7.
	Mueller's Botanical Teaching, 1877.
	Story on Agriculture of Victoria, 1861.
	Russales on Origin and Distribution of Gold in Quartz.
	Newmayer on a Scientific Exploration of Central Australia, 1868.
	Knight on
	the Australasian Colonies at the International Exhibition, London, 1862.
	Victoria Geological Survey, Parts 1 to 4, 1874-77.
	Mueller's Descriptive Notes on Papuan Plants.
	Report
	of Trustees of Public Library, Museum, National Gallery, etc., 1870-71.
	Descriptive Catalogue of the Mining, Metallurgical, Geological, and Agricultural Models in National Museum, Melbourne, Part 1.
	Catalogue
	of the Casts, Busts, Reliefs, and Illustrations of the School of Design, and Ceramic Arts in the Museum of Arts at the Melbourne Public Library, 1863.
	Catalogue of the
	Paintings in the Public Library, Museum, and National Gallery of Victoria.

BOOKS AND PAMPHLETS—Continued.

Donor.	Title.
Melbourne Public Library-----	Catalogue of the Melbourne Public Library, 1861 to 1865.
	Stewart on Pleuro-Pneumonia, or Catarrh, in Cattle, 1864.
	Catalogue of Collection of Products contributed by Western Australia to the Inter-Colonial Exhibition in 1866.
	Catalogue of the Rock and Mineral Specimens collected by the Geological Survey of Victoria.
	Pollard's Guide to British Emigrants to Victoria.
	Sessional Papers of the Australasian League Conference held May, 1852.
	Bleasdale on Colonial Wines, 1867.
	Hall on the Colonization of Northern Australia settlements under the amended Land Act of 1869.
	Statistical Summary of the Colony of Victoria, 1865.
	Vine lands in Victoria, and how to get them, 1856.
	Report of Register-General on Statistics of Victoria, 1851 to 1858.
	Achison on collection and storage of water in Victoria, 1861.
	Vocabulary of Original Dialects of Victoria.
	Maye's Resources of the Colony of Victoria, 1861.
	Archer's Report on the Progress of Victoria, 1867.
New Zealand-----	Statistics, 1875.
	Laws, 1876.
<i>Individual Donations.</i>	
American Pharmaceutical Association-----	Proceedings, 1877.
Burch, John C.-----	First Annual Report of California Pioneers.
Carr, E. S.-----	California Patrons of Husbandry.
Davidson, Professor-----	Irrigation in California and Irrigation in India.
Jones, Honorable John P.-----	Report of United States Silver Commission.
Marsh, Professor O. C.-----	Vertibrate Life in America; an Address delivered before the American Association for the Advancement of Science, at Nashville, Tennessee, 1877.
San Francisco-----	Municipal Reports, 1876-77.
Thompson, R. A.-----	History of Sonoma County, California.
Tyrrell, G. G.-----	Transactions of the California State Medical Society, 1877-8.
Sacramento Society of California Pioneers-----	Photograph of members of the Society (framed).

REPORT
OF THE
COMMISSIONERS OF FISHERIES
OF THE
STATE OF CALIFORNIA
FOR
THE YEARS 1878 AND 1879.



REPORT.

To His Excellency, William Irwin, Governor of California:

The Commissioners of Fisheries for the State of California, appointed under an Act of the Legislature, entitled "An Act to provide for the restoration and preservation of fish in the waters of the State," approved April 2d, 1870, respectfully submit their fifth biennial report.

We have to report an increasing public interest in fish culture and in the efforts of your Commissioners to continue the supply of valuable food fish in our waters. The destruction of fish during their seasons of reproduction, in defiance of law, once thought to be but a venial legal offense, is beginning to be considered a serious crime. As population increases, and railroads and other means of transportation are extended, there is a larger demand for fish; this is met by an increase in the numbers of fishermen, by extending the area of the fishing grounds, and by improved processes of capture.

SALMON (*ONCORHYNCHUS QUINNAT*).

One-half of the annual appropriation placed at the disposal of your Commissioners is expended in the hatching of salmon eggs and placing the young fry in the tributaries of the Sacramento River. From the organization of your Commission, and including the year 1879, we have had hatched and turned into the Sacramento River 13,150,000 young salmon; these, added to the natural supply, have been sufficient to make them as numerous in the river, during their seasons, as they have been at any time since so large an area of their spawning beds was destroyed by the operations of mining. Since our last report three additional establishments for the canning of salmon have been in operation on the Sacramento. If these establishments are to increase in numbers, with the consequent increase in the numbers of fishermen, boats, and nets, the supply of salmon cannot be kept up unless we add to the 2,500,000 of young salmon now annually placed in the river. To do this the appropriation must be increased, or we must abandon all other efforts at adding to the food fish of the State, and expend the whole appropriation in increasing the numbers of salmon. This last course would be unjust to large, important, and increasing interests in the State, and would be a violation of the intent of the law in creating the Commission. If there could be a faithful observance of the law that prohibits the catching of salmon during the close season; if the fish could have the river free from nets during these six weeks, and be allowed in peace to reach their spawning grounds, there would be no necessity for an increased appropriation, even if canning establishments were doubled and fishermen multiplied in the same proportion. During the close season, August 1st to September 15th, no salmon were pub-

licly exposed for sale in the markets, and outwardly the law seemed to be observed, but we have reason to believe they were caught and privately brought to San Francisco at night, and were served at hotels and restaurants to all who would call for them. The canning establishments ceased to purchase and tin salmon on the 1st of August, and, so far as we are advised, faithfully observed the law, but it is reported that many of the fishermen did not stop netting, and that more than one hundred tons of salt were sold in San Francisco about the 1st of August and shipped to by-places on the sloughs and islands of the Sacramento and San Joaquin, to be used in salting salmon during the close season. This illegal fishing is done at night, and the fish are taken before daylight to temporary shanties for salting and smoking, hidden in the wilderness of sloughs and tule islands. We have no means to prevent this violation of the law, and find but little disposition to assist on the part of the Justices of the Peace and Constables in the vicinity, who hold office by the votes of the men who violate the law.

The close season is now too short. Salmon in large numbers, with eggs fully matured, were on sale in the San Francisco and other markets from September 15th to the 1st of October, and yet we learn efforts will be made at the coming session of the Legislature to still further reduce it, or to change it to a time when there are no fish coming in from the ocean, or perhaps to completely abolish it. Experience in all the other States has demonstrated that fishermen as a class look only to their present profit, and are not willing to yield anything that the supply of fish in the river may be maintained.

The annual hatching of 2,500,000 of young salmon, and their distribution in the sources of the Sacramento, appear to keep the supply in the river equal to that of former years notwithstanding the increase in the number of sea lions protected by law, the increase in the nets and fishermen, and the erection of additional canning establishments.

The following table will show the relative catch for the years during which we have caused statistics to be obtained:

SALMON CAUGHT IN THE SACRAMENTO AND SAN JOAQUIN AND TRANSPORTED TO SAN FRANCISCO, SACRAMENTO, AND STOCKTON.

Open season November 1st, 1874, to August 1st, 1875	5,098,781 pounds.
Open season November 1st, 1875, to August 1st, 1876	5,311,423 pounds.
Open season November 1st, 1876, to August 1st, 1877	6,493,563 pounds.
Open season September 15th, 1877, to August 1st, 1878	6,520,768 pounds.
Open season September 15th, 1878, to August 1st, 1879	4,432,250 pounds.

The apparent falling off in the season of 1878-9 was not because the fish were not as numerous in the river as in former years, but in consequence of a dispute between the proprietors of the canning establishments and the fishermen as to the price to be paid by the former for the fish as they were caught. This dispute continued for some weeks during the height of the fishing season. The canning establishments stopped work, the fishermen formed an association and limited the catch to salmon for the supply of the San Francisco market. During this period but few fish were taken. The catch was, however, in excess of the requirements of San Francisco, and while the fishermen refused to sell average salmon on the fishing grounds to the canning establishments at twenty-five cents each, they forwarded them fifty miles to San Francisco and sold them for twenty-five cents and less. For a month the choicest salmon, weighing from sixteen to thirty pounds, could be bought from fishing boats at the

San Francisco wharves for one cent per pound. The dispute between the fishermen and the canning establishments, by which the river was practically open to the free run of the fish for nearly a month, will have one beneficial effect. It is equivalent to an increase in the length of the close season during the present year. The effect was soon observed on the McCloud and upper Sacramento. The spawning grounds were early filled with fish in greater numbers than ever before observed. The fish were so numerous in the McCloud before the fishermen renewed work on the lower Sacramento that in the pool at the United States Fishery, Mr. Livingston Stone, Deputy United States Fish Commissioner, estimated that in one haul of the seine he captured over two thousand salmon. From this dispute, resulting in an open river during the height of the run, thus allowing the fish to reach their spawning grounds, it is safe to predict an extraordinary run of salmon in the river in the season of 1883 and 1884.

The following report, made by Mr. H. D. Dunn, whom we employed to see if the law was obeyed during the close season on the Sacramento, and also to obtain statistics of the canning establishments, gives many facts of much importance. His statistics of the money invested in canning establishments on the Pacific Coast, and the number of cases put up during the past year, have much commercial interest. In his report he states:

In accordance with your directions, I visited Collinsville, Rio Vista, and Washington, on the Sacramento River, to inquire if there were violations of the close season for salmon, and to procure statistics of the quantities of that fish canned in 1878 and in 1879, up to the first of August. I have also collected all the data available of salmon canned in other portions of the State, and what amounts were put up in Oregon, British Columbia, and Alaska during the period named. With the single exception of the cannery located at Skeena River, British Columbia, I have obtained authoritative statistics, and herewith hand you statement of the same. The product of this cannery is mostly shipped to Great Britain via Victoria, Vancouver's Island, a small portion only of the catch of 1878 having been shipped in bond via San Francisco.

Owing to unfavorable circumstances, canning of salmon in California has this year been much less than during the same time in 1878. The spring run of salmon in the Sacramento came unusually early, commencing April 1st. The fishermen along the lower part of the river formed a combination, demanding forty cents per fish; the canneries offering twenty-five cents, as being all they could afford. The combination fishermen (mostly Greeks and Italians), by threats, and, in some instances, actual violence, prevented the delivery of any salmon from other boats at Collinsville and Chippis' Island canneries. The latter, however, obtained an insufficient and irregular supply of salmon by steamers from Rio Vista, which was subsequently much interfered with through the same means used in the vicinity of the canneries. Later the fishermen accepted the terms of the canners, and supplied fish; but the run ceased a few days later, the canneries closing June 6th. While the canneries at Collinsville and Chippis' Island were idle from want of fish, the cannery at Washington, Yolo County, procured a sufficiency at a less price than was refused by the lower river fishermen.

Being debarred supplying salmon to the Chippis' Island cannery, the fishermen (Germans), between Benicia and Montezuma Slough (a distance of 13 miles), made arrangements with a canning firm in San Francisco to put up and sell their catch, the total being about 6,000 cases. This firm expect to can more salmon this year, should the fall run (after September 15th) be sufficient, and, if the outlook is favorable, will continue in the business hereafter. The spring run of salmon in 1879 is reported as averaging twelve pounds per fish, dressed for canning. The market price for one pound salmon tins has been lower this year than before known—the ruling rates being \$1 05 @ \$1 10 per dozen.

Canners complain that the season for taking salmon is too short to admit of their doing a profitable business, and, that from the same cause, the fishermen cannot make a fair living and respect the law, without charging a higher price for fish than canners can pay and successfully compete with the put up of the Columbia River canners. They claim that, under the present law, the catch of salmon for canning purposes, does not last longer than six weeks on the Sacramento River, while it is fully four months on the Columbia River; that they have to prepare a full stock of cans in advance of the season's catch, and are put to many expenses for an entire year for not over six weeks' active work; that the spring run of salmon is irregular in times of arrival, varying as much as six weeks in different years. The spring run for canning in 1878 commenced May 15th, while this year there was a sufficient supply on March 29th to commence on.

While the canneries were idle in April, this year, large quantities of salmon were caught and sent to the markets in San Francisco, where they were sold in part at about freight charges, a great many spoiling and being thrown into the bay as unfit for any use. Adult salmon in large quantities are reported as sold in April, in this city, at from $3\frac{1}{2}$ to 6 cents each, the price rising May 1st to 15 and 20 cents each.

I have to report that, when at Collinsville on the 15th of August, I saw many salmon breaking in the river, and was informed by a Mr. W. Hosking, that at least 100 fish could be taken by a boat in making one drift of its net. From other parties I received information of violations of the close season, and while there I saw boats with nets going up the river to fish. Since my return I have seen letters from reputable persons, stating there were at least fifty boats out taking salmon in defiance of the law, and that one boat, containing 140 salmon, came to the wharf at Collinsville on 19th of August. The fish thus taken in defiance of law are mostly salted and smoked by the fishermen in the tules, a few probably being sent in a fresh state surreptitiously to this city. While on this subject, I desire to state my belief, that the Mr. Hosking referred to above is knowing to the continued violation of the salmon law, and from the circumstances of his position does much to encourage the same. He openly denounces the present law, keeps the only store at Collinsville, and does a large trade with the fishermen, who are more or less in his debt. He is Postmaster, Justice of the Peace, express agent, wharf keeper, and telegraph operator; so that all communications by letter or telegraph have to pass through his hands. The support of the citizens of Collinsville being largely derived from the salmon fishery, it would be difficult, if not impossible, to convict persons accused of violating the law under the circumstances stated.

COST OF CANNERIES IN CALIFORNIA.

Eight canneries, about \$25,000 each	\$200,000 00
Two hundred and twenty boats, about \$325 each	72,500 00
Two hundred and twenty nets, 250 fathoms each, \$300 each	66,000 00
One hundred and twenty scow-houses for men on the Sacramento River, about \$300 each	36,000 00
Total value of fixtures, etc.	\$374,500 00

No estimate is made for the boats and nets used at the canneries at Eel and Smith's Rivers.

Number of men employed in fishing, about 600.

Number of men employed in canneries, about 800.

Boats are 22 feet long, $6\frac{1}{2}$ feet beam, and 2 feet 6 inches deep; are sharp at both ends, have two lockers amidship to contain the fish, and have a large triangular sail.

The fishermen are all whites.

The can-makers are all whites.

The other workmen are all Chinese.

The catch of salmon in Smith's and Eel Rivers take place in September and October. The cannery at the latter place will not put up any salmon this year, owing to low prices ruling for such products.

STATEMENT OF SALMON CANNED IN CALIFORNIA IN 1878.

Two canneries at Collinsville, Solano County; one cannery at Chipp's Island, Solano County; one cannery at Rio Vista, Solano County; one cannery at Black Diamond Landing, Contra Costa County—total amount canned—cases	33,000
One cannery, Washington, Yolo County—cases	1,017
One cannery, Eel River, Mendocino County—cases	10,500
One cannery, Smith's River, Del Norte County—cases	4,277
Eight canneries—total cases, 4 dozen 1-lb cans	48,794

Average size of salmon dressed for canning, eleven pounds. The total number canned, about 222,000. Average value, \$5 40 per case, or \$263,487.

IN EIGHTEEN HUNDRED AND SEVENTY-NINE.

One cannery at Collinsville, Solano County—cases	588
One cannery at Chipp's Island, Solano County—cases	4,000
One cannery at Washington, Yolo County—cases	3,267
One cannery at San Francisco—cases	6,000
Four canneries—total cases	13,855

Number of salmon, about 67,523; average value, \$4 30 per case, or \$59,576.

The canning at Eel River will be closed this year. All the other canneries (except Rio Vista, which has been discontinued) will probably resume canning this year, if the fall run of fish should prove good.

COST OF CANNERIES, ETC., IN OREGON.

Thirty-five canneries, about \$25,000 each	\$875,000
Eight hundred boats in the Columbia River, \$325 each	260,000
Eight hundred nets in the Columbia River, \$300 each	240,000
Total	<u>\$1,375,000</u>

Nets in the Columbia River are about three hundred fathoms each. Number of boats, at five canneries not on the Columbia River, not known. Some of the canneries employ small steamers to collect salmon from the boats. Some few of the canneries on the Columbia River have cost from \$50,000 to \$60,000 each. About six thousand persons are employed in the canneries and fishing boats in Oregon, two-thirds of whom are Chinese. Average size of salmon when dressed for canning, fifteen pounds. The run of salmon in Oregon, except on the Columbia River, does not commence until August, and the catch at those places will not be known until late in the year.

STATEMENT OF SALMON CANNED IN OREGON, BRITISH COLUMBIA, AND ALASKA, IN EIGHTEEN HUNDRED AND SEVENTY-EIGHT.

One cannery at Sitka, Alaska—cases	2,750
One cannery at Prince of Wales Island, Alaska—cases	5,000
One cannery at Skeena River, British Columbia—cases	Unknown.
Seven canneries at Fraser River, British Columbia—cases	120,000
One cannery at Puget Sound, Washington Territory—cases	Closed.
One cannery at Gray's Harbor, Washington Territory—cases	5,420
Thirty canneries at Columbia River, Oregon—cases	445,000
Two canneries at Sinslaw River, Oregon—cases	10,300
Two canneries at Umpqua River, Oregon—cases	8,100
One cannery at Rogue River, Oregon—cases	8,000
Forty-seven canneries—total cases	<u>604,570</u>
Average value, \$5 40 per case, or \$3,264,578.	

IN EIGHTEEN HUNDRED AND SEVENTY-NINE.

One cannery at Sitka—reported cases	7,000
One cannery at Prince of Wales Island—cases	7,000
One cannery at Skeena River—cases	Unknown.
Seven canneries at Fraser River—cases	15,000
One cannery at Puget Sound—cases	1,300
One cannery at Gray's Harbor—cases	Unknown.
Thirty canneries at Columbia River—reported cases	438,000
Two canneries at Sinslaw River—cases	Unknown.
Two canneries at Umpqua River—cases	Unknown.
One cannery at Rogue River—cases	Unknown.
Forty-seven canneries—total cases	<u>468,300</u>
Average value, \$4 30 per case, or \$2,013,690.	

The catch at Gray's Harbor, Sinslaw, Umpqua, and Rogue Rivers is had in September, October, and November.

STATEMENT OF SALMON TAKEN FROM THE SACRAMENTO AND SAN JOAQUIN RIVERS, FROM SEPTEMBER FIFTEENTH, EIGHTEEN HUNDRED AND SEVENTY-SEVEN, TO AUGUST FIRST, EIGHTEEN HUNDRED AND SEVENTY-EIGHT.

65,046 loose salmon, weighing	1,626,150 pounds.
808 baskets and sacks of salmon, weighing	81,050 pounds.
2,361 boxes of salmon, weighing	170,715 pounds.
44 barrels of salmon, weighing	8,700 pounds.
48,794 cases canned salmon, weighing	<u>3,330,000 pounds.</u>
Total, say 304,411 salmon, weighing	<u>5,216,615 pounds.</u>
4,460 sturgeon, weighing	334,500 pounds.

STATEMENT OF SALMON TAKEN FROM THE SACRAMENTO AND SAN JOAQUIN RIVERS, FROM SEPTEMBER FIFTEENTH, EIGHTEEN HUNDRED AND SEVENTY-EIGHT, TO AUGUST FIRST, EIGHTEEN HUNDRED AND SEVENTY-NINE.

97,503 loose salmon, weighing-----	2,437,575 pounds.
312 sacks and baskets of salmon, weighing-----	37,740 pounds.
452 boxes of salmon, weighing-----	41,086 pounds.
18 barrels of salmon, weighing-----	4,950 pounds.
40 cases of smoked salmon, weighing-----	12,400 pounds.
13,855 cases of canned salmon, weighing-----	1,012,850 pounds.
Total, say 171,438 salmon, weighing-----	3,546,601 pounds.
7,104 sturgeon, weighing-----	607,800 pounds.

The above statements do not include the catch above Sacramento on the Sacramento River, or above Stockton on the San Joaquin River. In former reports we have added 25 per cent. to the figures reported as being a fair equivalent for the unreported catch above Sacramento and Stockton, and for the fish caught during the close season and salted and smoked in by-places in the tules. Adding this would make the catch of salmon of the season of 1877-8 as 6,520,768 pounds, and the season of 1878-9 as 4,433,250 pounds, as heretofore stated.

The catch of the season of 1877-8 was the largest of any since we commenced obtaining statistics, and is in fact the practical result of artificial hatching. Fish hatched in a given year do not begin to show in the returns until three or four years after the young fish are placed in the water. After nine years of study and observation, combined with considerable practical experience, we are prepared to answer the question as to the practicability of keeping up the supply of salmon in the Sacramento, notwithstanding the increase of population, extended facilities for transportation, and the multiplication of canning establishments, nets, and fishermen.

First—There must be an honest close season, faithfully observed by the fishermen, to allow a portion of the ripe fish to reach the spawning grounds. This would keep up a normal supply in the river, which normal supply would depend upon the area of clean gravel beds at the sources of the streams over which pure water was passing of a proper temperature. It would also give a supply of fish at the only places where their eggs could be taken for artificial hatching.

Second—The thousands of sea lions and seals at the Golden Gate and in the bay—carefully protected by legislative enactment—without doubt catch more fish annually than all the nets of the fishermen. These rapacious animals observe neither close season nor Sunday, live wholly on fish, and are unceasing in their work of destruction. They should be reduced in numbers or driven to some other part of the coast.

Third—A portion of the fish being allowed to reach their spawning grounds, and their destruction by sea lions and seals at the Golden Gate prevented, the number of salmon in this river would depend simply on the amount of money which the Legislature should deem proper to appropriate for the purpose.

After the female salmon escapes all her enemies in the ocean, the sea lions at the Golden Gate, the seals in the bay, and miles of nets in the river, and swims blindly against a stream of more than one hundred miles of muddy water thick with mining sediment and at last reaches the clean gravel beds of the ice-cold sources of the river

to perform the duties of maternity, she is still beset by numerous enemies. In the most favorable streams, the areas are not large—having proper beds of gravel, appropriate depth, and the right temperature of water—on which the eggs can be deposited. When the eggs are deposited, observation and experiment have shown that only an average of eight per cent. of them come in contact with the fertilizing sperm of the male—ninety-two per cent., of course, die. This eight per cent. is liable to be destroyed by trout and other fish, or to be smothered by a deposit of sediment caused by heavy rains on the summits of the mountains.

A mature female salmon of the Sacramento will yield 800 eggs to each pound in weight of the fish; thus, a fish of 20 pounds will yield 16,000 eggs. It has been estimated that, in a state of nature, not more than two eggs in a thousand ever become fish. This would give the product of the 16,000 eggs, 32 fish. By the discoveries in artificial hatching, these 16,000 eggs can be made to produce 15,000 fish. Every egg can be fertilized and kept under control and inspection in the most favorable conditions as to the current, purity, and temperature of the water, shaded from the direct rays of the sun, and closed securely against the almost innumerable finned, winged, and furred enemies that are seeking to devour it. The young fish, when they come from the egg, can be kept and fed until the most favorable period for placing them in the river. One million eggs can be taken, fecundated, hatched into young salmon, and turned into the river at an expense not to exceed \$1,200, and larger numbers at a less ratio. As they find in the ocean the food upon which they grow and become fat, they exhaust nothing from the river; therefore, if some fish are allowed to reach their spawning grounds, the number of salmon in the river can be in proportion to the amount of money the Legislature may see proper to appropriate for their artificial hatching.

WHITE FISH (COREGONUS ALBA).

Through the kindness of Professor Baird, United States Fish Commissioner, we have, since our last report, received from Lake Michigan, as a donation, nearly one million eggs of this most valuable food fish. The first lot of 300,000, which arrived January 20th, 1878, had been so kindly cared for by the agents of the express company that they were placed near the stove in the car, and were killed by the heat on the journey. The second lot arrived in good condition, and were successfully hatched out at the State hatching-house, San Leandro, and were distributed as follows:

January 11th, 1879—To Lake Tahoe, Donner Lake, and lakes at summit of Sierra	200,000
January 18th, 1879—To Eagle Lake, Lassen County	225,000
January 21st, 1879—To Tulare Lake	100,000
February 1st, 1879—Mark West Creek	10,000
February 17th, 1879—San José Water Company's reservoir	10,000
February 17th, 1879—Lake Chabot	20,000
Total	565,000

Some of the previous importations of these fish, planted in Tahoe, Tulare, and Clear Lakes, have thrived, and a few mature fish are reported as having been caught in each of these lakes. All of these bodies of water will, without doubt, within a few years, be stocked

with this valuable fish. As the white fish is only taken by nets, these lakes will be fully stocked before it will be found profitable for fishermen to make a business of catching them. A discovery of some importance in the care of the young of the white fish was made by Mr. J. G. Woodbury, in charge of the State hatching-house. This fish lives on the crustacea found on the rocks at the bottoms of deep lakes, and as it was not known on what the young fish could be fed, it has heretofore been necessary, within a few days after the young fish have emerged from the egg, to place them in the lakes to find their own food. Mr. Woodbury found that by pounding to a jelly the flesh of the common salt-water crab, the young white fish would eat and thrive upon it. He kept 50,000 on this food for more than two months. This discovery is of much interest, as it enables the young fish to be kept for some time, and thus distributed to stock mountain lakes that are inaccessible during the winter months.

SHAD (*ALOSA SAPIDISSIMA*).

In June, 1878, we received from Professor Baird, United States Fish Commissioner, from Havre de Grasse, 115,000 young shad; these were placed in the Sacramento River at Tehama, where all previous importations have been planted. The State has now received from the United States Government, and by our own importations, in all, 400,000 of these fish. There can be no doubt they find congenial homes in Pacific Coast waters, and are thriving and producing their kind. Several thousand mature fish have been taken and sold in the San Francisco markets during the spring of 1879. A few are found in market during almost every month in the year. After leaving the Sacramento River, the great body of these fish follow the coast south to the Bay of Monterey, where they must remain, finding an abundance of food; for a few are caught in the nets of the fishermen in this bay during every week throughout the year. If the appropriation were larger, we would do more towards stocking our rivers with this fish. No discovery has yet been made of any substance with which the young can be fed, and as seven days is the longest period they can be kept alive without food, we are compelled to take the number of young fish hatched from the eggs of one night's catch in an Atlantic river, and hurry them by express trains across the continent to Sacramento. The expense of such a journey with the necessary attendance, is almost \$1,800, and as the number of fish to be obtained is uncertain, a larger importation of young shad would involve an expense which would lessen the number of young salmon which it seems imperative we should supply to the river each season.

SCHUYLKILL CATFISH (*AMIURUS ALBIDUS*).

In 1874 we imported from the Raritan River, and placed in lakes near Sacramento, 74 of these valuable fish. These have increased to millions and furnish an immense supply of food. They have become so numerous that they are as regularly on sale in the city markets as the most abundant native fish, and are sold at about the same prices. They thrive in our rivers and lakes, and in the still-water sloughs of our plains, as well as in the brackish sloughs in our tule lands. They appear to be equally at home in lakes on the mountains and in artificial reservoirs in the valleys. Many farmers

who have natural ponds on their farms, or who have surplus water from wind-mills and have made artificial ponds, have stocked them with this excellent fish. The produce of the few fish of this species, imported in 1874, now annually furnishes a large and valuable supply of fish food to people in the interior of the State. The value of all the fish of this species, now caught annually and consumed as food, would more than equal the annual appropriation made by the State and placed at the disposal of the Fish Commissioners. This variety of catfish has valuable characteristics which admirably fit it for wide distribution and for self-preservation in the struggle for existence. The female makes a round nest in the bottom of a pond in which she deposits usually from 3,000 to 5,000 eggs. These are fecundated by the male who then leaves them to the care of the female. The mother remains over them fanning them with her fins, probably to keep them oxygenated with fresh currents of water, as well as to prevent them being smothered by sediment. She remains in constant attendance, driving away every fish that approaches her nest. In from six to ten days the young make their appearance. Her care does not cease with the birth of the young fish. She now swims about them in a circle, keeping them together until all are hatched. When all the young fish are fitted to swim she leads them off to find food, still keeping them in a body by circling about them and driving back wanderers, as a trained shepherd dog drives in a wandering sheep; she will at the same time fight any other fish that comes near her charge. In another week or ten days they are prepared to search for their own food, when they gradually disperse. Since our last report we have distributed 39,000 of these fish to public waters to stock rivers, ponds, and reservoirs in the Counties of Butte, San Joaquin, Yuba, Sonoma, Ventura, San Diego, Sacramento, Placer, El Dorado, Alameda, Colusa, Yolo, Sutter, Nevada, Stanislaus, Tuolumne, Modoc, Los Angeles, Mono, Solano, Mendocino, and Lassen.

LAND-LOCKED SALMON (*SALMO SEBAGO*?).

In January, 1878, through the kindness of Professor Spencer F. Baird, United States Fish Commissioner, we received from the United States hatching-house of Grand Lake Stream, Maine, 50,000 eggs of the land-locked salmon. This fish is found in a few lakes in the northern part of the State of Maine. In structure they are the same as the Atlantic salmon (*salmo salar*). They have probably been derived from the Atlantic salmon, which, by some natural cause at a remote period, were prevented from returning to the ocean. Their descendants, finding sufficient food in these lakes, have lost the instinct which compelled their ancestors to return to the ocean, and they are now fitted to live continuously and breed in fresh water streams and lakes. As was stated in our last report, the California salmon (*quinnat*) has the same characteristics, and readily adapts itself to a life in fresh water. The reservoir of the Spring Valley Water Company, supplying San Francisco with water, and known as San Andreas and Pilarcitos, are well stocked with salmon, the product of those prevented from returning to the ocean by the constructions of the dams. Lake Chabot, the reservoir from which the City of Oakland is supplied with water, is also well stocked by the same means, and from young salmon placed therein. In the winter of 1875-6 a large number of young salmon were placed in the Truckee

River. This river has its rise in Lake Tahoe and flows into Pyramid Lake, in Nevada, and has no outlet to the ocean. Some of these salmon are reported to have been taken with the hook in the Truckee River this season, weighing from three and a half to five pounds. The size to which the Sacramento salmon will grow when confined to fresh water depends upon the quantity of food to be found in the lake or stream. A few years after the dam was erected at the San Andreas reservoir salmon were taken in it weighing from six to twelve pounds. In ten years they have multiplied until hardly any other fish are taken, but now do not average to exceed three-fourths of a pound. They now mature their eggs and milt when less than a pound in weight. The land-locked salmon of Maine do not average over six pounds in weight, but they are numerous in the lakes, furnish a large amount of food, and yield much sport to the angler, as they readily take both fly and bait. As they are natives of the cold lakes of Maine we have thought the most appropriate places for the distribution of the young fish would be in our mountain lakes; but, for purposes of testing their fitness to thrive in warmer waters, a portion were also distributed to lakes in the valley and on the coast, as follows:

March 16th, 1878—Donner Lake and other lakes near the summit	10,000
March 20th, 1878—San Francisquito Creek, Espenosa Lake, etc.	10,000
April 6th, 1878—Tulare Lake	15,000
April 7th, 1878—San Leandro Creek and Lake	2,500
April 8th, 1878—Arroyo Laguna, near Sunol	700
April 19th, 1878—Reservoir at Alms House, San Francisco	1,000
April 30th, 1878—Echo Lake, El Dorado County	250

EASTERN BROOK TROUT (*SALMO FONTINALIS*), PACIFIC COAST BROOK TROUT (*SALMO IRIDEA*), DOLLY VARDEN TROUT (*SALMO CAMPBELLII*), AND TAHOE TROUT (*SALMO TSUPPITCH*).

In January, 1878, and in January, 1879, we received from Wisconsin and New Hampshire 70,000 eggs of the Eastern trout. The young fish were hatched at the State hatching-house, San Leandro, and were distributed as follows:

March 1st, 1878—Streams in Santa Barbara County	5,000
March 16th, 1878—North Fork of the American, Prosser Creek, and Truckee River ..	10,000
March 19th, 1878—Kaweha River, Tulare County	5,000
March 20th, 1878—Carmel and streams in Monterey County	7,000
March 25th, 1878—Streams in Alameda County	2,000
March 26th, 1878—San Leandro Creek, Alameda County	5,000
March 30th, 1878—Russian River and Sulphur Creek, Sonoma County	6,000
April 5th, 1878—Santa Rosa and Mark West Creeks, Sonoma County	3,000
April 5th, 1878—Streams in Santa Cruz County	2,000
April 5th, 1878—Streams in San Mateo and Santa Cruz Counties	4,000
April 8th, 1878—Alameda Creek and tributaries, Alameda County	2,000
April 15th, 1878—Calaveras Creek and small streams, Alameda County	2,000
March 1st, 1878—North Fork of American, South Yuba, and tributaries of Truckee River	20,000
March 29th, 1878—Yosemite Valley	1,000

Of the trout eggs of California trout procured from McCloud River, the young fish were distributed as follows:

March 30th, 1878—Russian River and tributaries	6,000
March 30th, 1878—Santa Rosa and Mark West Creeks	3,000
April 5th, 1878—Santa Cruz, Aptos Creeks, etc.	4,000
April 8th, 1878—Alameda Creek and tributaries	2,500
April 7th, 1878—Streams in Santa Clara County	2,000
April 18th, 1878—Streams in Santa Cruz County	10,000
May 9th, 1878—San Lorenzo Creek, Alameda County	1,000
May 9th, 1878—Streams in Alameda County	5,000
March 21st, 1879—Streams in Santa Cruz and San Mateo Counties	7,500
March 27th, 1879—Streams in Santa Clara and Monterey Counties	9,000
March 29th, 1879—Yosemite Valley	20,000
April 1st, 1879—San Gregorio and Pescadero Creeks, San Mateo and Santa Cruz Counties	8,000
April 1st, 1879—Streams in Alameda County	1,000
April 3d, 1879—Tuolumne River	2,000
April 7th, 1879—Streams in San Mateo County	7,000
April 15th, 1879—Streams in Alameda County	6,700

The few Dolly Varden trout that we succeeded in hatching were distributed in streams at the summit, and in the Truckee River.

In September we purchased 50,000 young Tahoe trout that had been hatched by Mr. Frazer, and distributed them in the Truckee River, in the North Fork of the American, and in the South Yuba. These fish were placed in the Truckee on the petition of the people residing on that river, who complained that for some years the trout in that stream had been gradually decreasing in numbers. There are now fish ladders over the dams on the Truckee, and, if maintained, it is probable a supply of trout can be kept up in this river.

The eastern trout does not appear to thrive in the streams of the Coast Range of mountains. These mountains are composed of sand stone, which is readily worn by the winter rains and, at certain seasons, all the streams from them carry a large amount of sediment and become more or less discolored. There is also a great difference in the temperature of the water in winter and summer. The native home of the eastern trout, as its name implies, is in the clear cold sources of mountain streams. Wherever planted in the cold clear streams of the Sierra Nevada, in water flowing over granite and slate, they find congenial homes, and thrive and propagate equally with the native trout.

Probably there is no trout more valuable for wide distribution than the Pacific Coast brook trout (*Iridea*). It grows rapidly, occasionally weighing seven pounds when it can feed in salt water at the mouths of coast streams, and often weighing five pounds when confined entirely to fresh water containing an abundance of food, as in the McCloud River. Some specimens of McCloud trout, kept in the hatching-trough in the fishery at San Leandro, grew to average seven inches in length in one year from the time the eggs were placed in the hatching trays. It does not seem to be injuriously affected by a long continuance in water containing a large amount of muddy sediment. We are not aware of experiments having been made to test, with exactness, the highest temperature of water in which it will exist and thrive, but without doubt it will live in water so warm as to be fatal to eastern trout. We believe it could be successfully introduced into streams on the Atlantic Coast where eastern trout would not thrive.

LOBSTERS (*HOMARUS AMERICANUS*); EELS (*ANGUILLA*); STRIPED BASS (*ROCCUS LINEATUS*), AND BLACK BASS (*MICROPTERUS NIGRICANS*).

In 1874, with the aid and experience of Mr. Livingston Stone, we made the attempt to stock the waters of the Bay of San Francisco with lobsters. Mr. Stone left Boston in a car prepared with all the appliances then known for transporting fresh and salt water fish. One portion of his charge consisted of 150 lobsters. With the exception of four all of these died on the journey. These four were placed in the Bay of San Francisco at the end of the Oakland pier. They were alive, but seemed feeble, and we had small hope that they would survive and propagate. Since that time reports have been made that young lobsters have been caught in the bay. An examination of all that have been brought to us, as young lobsters, has shown that they belonged to some other family of crustacea. In July of the present year (1879), Mr. Livingston Stone again made the attempt to bring lobsters, eels, striped bass, and black bass from the Atlantic States. Availing himself of his experience obtained in former journeys, and having learned by repeated experiments a method of retaining ocean water in a state of purity in small tanks, he succeeded, by constant work and assiduous attention, in bringing from the Atlantic Ocean and depositing in the Pacific Ocean at the Golden Gate, 24 female lobsters. It is estimated that these lobsters had attached to them more than two million eggs, all of which would hatch within a week from the time they were deposited. We believe we can now look forward with confidence to the time when lobsters will be found in abundance in our waters.

In 1874 a few young eels were brought from the Atlantic and planted in lakes near Sacramento, and others in the Bay of San Francisco, near Brooklyn. We have no reports of those placed in the salt-water. Several have been taken in the fresh-water, near Sacramento, full grown, and three feet in length. Finding they would thrive, we obtained, through Mr. Stone, 4,000, which, in July, were planted, one-half in the Sacramento River, and the other half in Alameda Creek. Without doubt they will, in a few years, fill our streams.

At the same time Mr. Stone brought from the Neversink River, New Jersey, 150 young striped bass, which were successfully turned into the brackish water of the Sacramento River, at Martinez. It is to be hoped they will escape the nets of fishermen, the sea lions, and seals. Should a few pair survive their enemies and propagate they will add a most valuable food fish to our salt, brackish, and fresh-waters.

The 73 black bass brought in the aquarium car of 1874 were planted in Napa River. A number of these were caught in 1875, and probably all were exterminated by anglers, who could not wait until time had been given the fish to breed. We can hear of none having been caught during the past two years. We have again made the attempt to introduce this valuable fish. In July last Mr. Stone again brought 24 black bass, and 22 fully mature fish were placed in the Crystal Spring reservoir of the Spring Valley Water Company, in San Mateo County. We have the assurance of the officers of the company that this reservoir shall be preserved, and no fishing allowed in it for three years, or until such time as we desire to take young bass for stocking other waters.

CARP (*CARASSIUS VULGARIS*).

We have been unable as yet to introduce the king carp, with which to stock our inland sloughs and warm water lakes. This, the most valuable variety of the carp family, was imported from Germany by Professor Baird, United States Fish Commissioner, a few years since, and has increased to large numbers in ponds at Washington and Baltimore. They could not be obtained in July, at the time Mr. Stone left with fish for California. We now hope to receive the State's quota in June, 1880, with another consignment of young shad. It is certain they will thrive in California, as another variety of carp, imported as a private speculation some years since, has been extensively distributed over California, and now furnish a large amount of food to people in the interior valleys. We do not know any fish so desirable for wide distribution throughout the State as this carp. They are of good flavor, grow rapidly, are tenacious of life, can live on aquatic vegetation, and in water too warm for almost all other valuable varieties of food fish. We can hardly do a more useful work than in the breeding of these fish, and stocking all our interior streams, lakes, and sloughs with carp.

FISH-WAYS.

We have caused a few suits to be commenced to compel the owners of dams to construct fish ladders. In almost all cases, when notified, the owners of dams have complied with the law. It is generally understood by the people of the State, that to preserve fish in our rivers, it is absolutely necessary that fish should be allowed to reach their spawning grounds. The efforts of your Commissioners to keep up the supplies of fish in our rivers, and to add new and valuable varieties, appear to be appreciated, and we find there is in almost every neighborhood some man who has sufficient interest in the subject to call our attention to obstructions when such exist.

OCEAN AND BAY FISH.

More than ninety varieties of fish are caught in the Bay of San Francisco, and in the Bays of Monterey and Tomales, which are sold for food in the San Francisco market and shipped to various points in the interior. This gives employment to many hundred men, and their work furnishes a vast amount of food to our people. So far as we have been able to ascertain, but one variety is identical with an Atlantic Coast fish (the halibut). The consumption of fish is so large on this coast that it seemed desirable to obtain the statistics in relation to it. We have found this very difficult. Many of the fishermen are Greeks, Italians, Portuguese, and Chinese, who do not speak English, and few keep a written record of their catch. The dealers do not care to exhibit their books. Many of our fish are without English names, and one English name is made to apply to different varieties of fish. Two of the varieties of fish sold as smelts in our markets do not belong to this family. Three different fish are sold as candle fish, etc. Where fish, as in the case of salmon, are mostly brought to market by transportation companies, the annual catch can be ascertained with approximate correctness. At present it seems impossible to obtain statistics of the catch and consumption of

salt-water fish. Not being able to obtain these facts, it then seemed desirable to know what salt-water fish furnish the largest amount of food to our people? What are their names, and in what months are they most numerous? To ascertain these facts and make a record of them, we obtained the valuable services of Mr. W. N. Lockington, who for some years has been making a study of the fish of this coast, and who has added to the science of ichthyology several new varieties. Mr. Lockington has watched the market for a year, keeping a record of all the varieties of fish sold as food, their first appearance, abundance, and disappearance. His report, which follows, will be found of great value, as it is the first attempt to collate, classify, and name the various fish which make their appearance in the San Francisco markets during a year.

APPROPRIATION AND EXPENSES.

A detailed statement of the appropriation received and expenses incurred will be found at the close of this report. We are gratified that the work of the Commissioners appears to be approved by the public. We may be pardoned in the expression of the belief that not many other of the State's appropriations produce more beneficial and practical results. When fish valuable for human food are introduced into barren waters, or when valuable fish are made to supplant worthless kinds, the beneficial results are not confined to the present time and to the present generation of men. With that better observance of wise laws for the preservation of fish that is sure to come with increased intelligence these beneficial results will spread and increase, and the produces from the fish now introduced and planted will furnish food to those who come after us so long as our streams continue to flow, and while our lakes and reservoirs continue to hold water.

REPORT UPON THE FOOD FISHES OF SAN FRANCISCO

BY W. N. LOCKINGTON.

About ninety species of fishes are brought in greater or less numbers to the markets of San Francisco, either at certain seasons or during the greater portion of the year. Most of these are in esteem as food fishes, while the remainder, either from their scarcity, their small size, their repulsive appearance, or their actual deficiency of flavor, are not usually eaten by people of European descent, though some of the more abundant kinds are in favor with the Mongolians.

In the following pages it is proposed to bring together a few facts relating to the comparative abundance, seasonal and geographical distribution, size, etc., of the various species used to any extent as articles of food, together with such notes upon their food and habits as the limited opportunities of the writer have enabled him to collect. Particular care will be taken to point out some of the more obvious characters of each species, so that any one interested in the important subject of our fish supply may be able to distinguish them. Little attempt at technical description will be made, and the synonymy will be limited to the recognized name of each species, together with, in some cases where a change has recently been made, the title given by its original describer. The writer regrets the paucity of his original information, but a beginning must be made, and he trusts that all who are in possession of facts relating to our fishes will report the same to him or to the Fish Commissioners.

The groups of fishes which are of most importance, from an economical point of view, are the *Salmonidæ* (using the word in its old meaning), the *Embiotocidæ* or viviparous perch, a family almost confined to this coast; the *Pleuronectidæ* or flat-fishes, and the rather heterogeneous group commonly known by the English name of rock-fish or rock-cod, and comprising numerous species of the family *Scorpenidæ*, with others belonging to the *Chiridæ*.

Probably the *Salmonidæ*, including as it does the *quinnat* and other anadromous salmon, together with the lake and brook trouts and the smelts, is the most important of these groups, since the *quinnat* and other species of the genus *Oncorhynchus* not only furnish a large proportion of the fish supply of this coast, but are canned in large quantities for exportation.

As the particulars of the salmon supply, with the details of the work done in hatching and preserving the young of these valuable fishes, have been given in the regular report of the Fish Commissioners, the present report will deal only with the small marine species of the group. It would not be easy to say which of the other three groups mentioned above is of most importance as food, since each of them contains from thirteen to eighteen species, some or other of which are plentiful during every season of the year; but the three contain the greater proportion of the individuals and spe-

eies usually sold in the markets. Next to them come the sturgeon, the *Sciaenidæ*, which family furnishes two valued species, the *Atherinidæ*, or so-called smelts, and lastly the *Gadidæ*, or codfish, and the *Clupeidæ*, or herrings, two families which do not occupy the prominent position accorded to them elsewhere, since only one or two species of each are sufficiently abundant to form an important item in the total fish supply. Several species of *Scombridæ* (mackerel, as the family was defined by the older naturalists) occur along the coast of California, but none of these are taken, except occasionally, in the immediate vicinity of San Francisco, and none of them are brought to our markets either regularly or plentifully.

With the exception of a single species of skate, all the marine fishes habitually eaten by the white residents of the city belong to one or other of the families enumerated above.

The quantity of fresh-water fishes (excluding the salmon) brought to our markets is not very large, and consists chiefly of four species of *cyprinidæ* (*Eventognathi*, Gill) and the Sacramento perch.

Certain introduced fishes are now becoming sufficiently abundant to be worthy of enumeration among our food fishes, although they are only occasionally brought to market, and are sold at a high price. These are the shad, *Alosa sapidissima*, the Prussian carp, *Carassius vulgaris*, and a species of catfish, *Amiurus albidus*. The first of these is still very scarce, and fetches a very high price, but some examples attain quite respectable dimensions, and the supply is tolerably constant. The largest I have seen measured twenty-six inches in length by seven in width; another was twenty inches long by five and a half wide; and a third intermediate between these. The Prussian carp was first introduced by Mr. Poppe, of Sonoma County, but has since been raised at other places. Those sent to the market were from Port Harford.

During the time that the writer has systematically watched the market he has been so fortunate as to discover several new species of fishes, of which three belonging to the *Pleuronectidæ*, a *Lycodoid*, and a *Scomberoid*, are of more or less value as food fishes. This occurrence of previously undescribed species, as well as the abundance of numerous other species formerly little known, may be partially attributed to the fact that the fishermen now trawl in deeper water than formerly, going to thirty-six fathoms or more, and partially to the facility with which, now that railway communication is established, the fishermen of Monterey and other places can send their catch to San Francisco. In the days when Dr. Ayres watched the markets and described so many of our fishes, the Monterey fishermen did not have the advantage of supplying the San Francisco market; on the contrary, the fishers of our bay sent a portion of their catch to points between San Francisco and Monterey that are now supplied by the Monterey fishermen. This competition, together with the vast quantities taken out of the bay by the Chinese, the havoc worked by the protected legion of sea lions at the entrance of the Golden Gate, and the want of any close time for the more useful kinds of fishes, threaten, in the course of time, to make the local fishery unremunerative to the hard-working men engaged in it. It is much to be regretted that the white fishermen themselves, by their indiscriminate destruction of young fishes, and uncompromising slaughter of adults during the spawning season, appear anxious to hasten that destruction.

Already the fishery carried on in the Bay of San Francisco is much less productive than it was in the early days of the American occupation; species that were once common have become scarce, and others still tolerably abundant fail to attain their full dimensions. Nor is over-fishing the sole cause of this. The constant hurrying to and fro of the numerous ferry-boats and other steamers, indispensable to our comfort, tends to drive away the timid finny tribes, whilst the ashes and cinders let fall injure the character of the bottom.

But the injury from this source is small compared with that inflicted by the constant fouling of the waters and consequent destruction of life by the fœtid inpourings of our sewers; by that foolish waste of organic substances, which has now become an integral part of what we consider civilization, materials which, if spread upon the land, would cause our sandy wildernesses and bald hill-sides to bear a luxuriant crop of cereals, and would thus bring life, or, which is almost the same, the means of life, to thousands of human beings, are now poured into the waters to pollute them for the destruction of creatures on which human beings are largely dependant for the means of life. As the supply in San Francisco Bay has become limited the scene of wholesale destruction is now shifted to Tomales Bay, whence a very large proportion of our fish supply is now brought. Although the fishes of the cod family are not prominent among the supply of fresh fish sold in the markets, codfish are extremely abundant on the shores of British Columbia, Alaska, and Kamtschatka, and about thirteen vessels belonging to San Francisco are engaged in the cod fishery, which is carried on in much the same manner as that of the Newfoundland Banks. Rather the larger portion of the catch, which in 1878 amounted to about 1,500 tons, is taken in the Okhotsk Sea, the remainder principally at the Shoumagin Islands. The greater part of the supply is consumed in California; but some is sent to South American ports upon the Pacific, and even to Australia. The drying of these fish is not done upon the spot, but at drying establishments on the shores of San Francisco Bay. The fishery is at present carried on in comparatively shallow water, although, as in the Atlantic, it is observed that the fish from deeper water are the best. The cod of the Pacific cod-fishery is a true *Gadus*; but, as no entire specimens have yet been carefully examined, it is uncertain whether it is to be referred to *Gadus auratus*, Cope, or to one of the species described by older writers.

Small quantities of halibut (*Hippoglossus vulgaris*?), herring (*Clupea mirabilis*), and eulachon (*Thaleichthys pacificus*), are preserved in various ways for the San Francisco market, but these branches of our fisheries are in their infancy.

The halibut is abundant, attains large dimensions, and is probably equal in every respect to that of the Atlantic, yet it cannot compete in San Francisco with the Eastern article. It is occasionally canned like the salmon.

The eulachon is one of the fishes which, from their oiliness and the use made of them by the Indians, are called "candle-fish." Some are brought down in salt, while others are put up with oil in boxes and sold as sardines.

SUBCLASS TELEOSTEI, BONY FISHES.

In the fishes of this subclass, the skeleton is more or less ossified, instead of cartilaginous, as in most of the *Ganoidei* (sturgeon, etc.), and in the *Elasmobranchii* (sharks, rays, etc.). The caudal fin is regular or homocercal, rarely absent; the optic nerves from opposite sides simply

cross without forming a network or chiasma; the arterial bulb of the heart is simple, and provided with two valves at its origin; the air bladder is simply what its name denotes, never becoming cellular or lung-like; opercles or gill-covers are always present, and the body is usually covered with scales, though in some cases scaleless, or with prickles or bony plates in lieu of scales. This subclass comprises all those vertebrates usually called fishes, except the somewhat miscellaneous group *Ganoidei*, of which the sturgeons are the only representatives upon the coast of California; the *Elasmobranchii*, comprising the sharks and rays, which are not generally used for food; the *Marsipobranchii* or lampreys and hags, the former often eaten; and the *Leptocardii* or lancelets, the lowest of vertebrates, if indeed they are entitled to that name at all.

The *Teleostei*, according to Professor Gill's classification, are divided into the orders *Teleocephali* or ordinary fishes; *Nematognathi* or silurians, comprising the catfishes and numerous other forms, chiefly fresh-water, all characterized by the presence of from four to eight long barbels around the mouth, the longest a continuation of the incomplete maxillary, and with numerous other characters which render them a compact group; *Apodes* or eel-like fishes, having no ventrals, the scapular arch or shoulder-girdle free from the skull, instead of attached to it as in the other orders, and an elongated, snake-like body; *Pediculati*, including a few strange forms in which the pectoral fins are carried by elongated bones, which foreshadow those of the forelimbs of higher vertebrates, and which have small gill openings behind the pectorals; *Plectognathi*, balloon fishes, etc., which have the intermaxillary and maxillary bones firmly united; and *Lophobranchii*, pipe fishes, which have their gills in small tufts instead of in long comb-like series, as is the case in all the preceding orders, and the mouth small and toothless, placed at the end of a long snout. Besides these are the two small orders *Scyphophori* and *Opisthomi*, neither represented on this coast. As all the indigenous *Teleostei* of California, ordinarily used as articles of food, belong to the first of these orders, *Teleocephali*, it may be as well to dismiss the others with a few words so as to avoid future reference to them.

Although the order *Nematognathi* has numerous representatives in North America (Jordan, catalogue of fresh-water fishes, pages 414-415, enumerates 28), and may be said to have its headquarters in South America, not a single species is indigenous in the streams of the Pacific Coast; and the order *Apodes* is not represented in the neighborhood of San Francisco. Here, then, we have two remarkable features of our fish fauna, no catfishes and no eels in our rivers, for though several kinds of fishes, both fresh-water and marine, are often called eels, they are only elongated *Teleocephali* or else lampreys. The *Pediculati* are represented in Lower California, but not in Upper California. Only a single *Plectognath* fish is ever brought to our markets, although another species occurs in the southern part of California, and the order has several representatives farther south. This solitary *Plectognath* is the wide-spread *Orthogoriscus mola* or sun-fish, if, as seems probable, it is really identical with that Atlantic species. I have not yet had the good fortune to meet with a fresh example, but a small specimen is in the Museum of the California Academy of Sciences, and a larger, about three feet long, in the collections at Woodward's Gardens. In the Proceedings of the California Academy of Sciences of 1867, page 141, Mr. R. E. C. Stearns mentions the occurrence in the market of a specimen, 5 feet 8½ inches in extreme length, and 7 feet 6 inches in width from tip of dorsal to tip of anal. The small specimen, on which Dr. Ayers founded his *Orthogoriscus analis*, was taken in Santa Barbara Channel.

The *Lophobranchii* are represented in our bay by two species of pipe-fishes, *Syngnathus dimidiatus* and *Syngnathus griseolincatus*, both occasionally brought to market, but both too small to be used as food, and in the more southern part of our coast by *Hippocampus ingens*, the great Californian sea-horse, of which our museum possesses a single specimen.

The *Teleocephali* include the greater part of the orders *Malacopecteri*, *Anacanthini*, and *Acanthopteri* of older naturalists, but as Professor Jordan well remarks, "however different the extremes of each (as *Percoidei* and *Cyprinoids*) may be, the intervening forms are too closely related to render it possible to characterize them as distinct orders."

The suborders now recognized in this large order are the *Heterosomata* or flat-fishes, the *Anacanthini*, the *Acanthopteri*, the *Percesoces*, the *Hemibranchii*, the *Syngnathini*, the *Haplomi*, the *Isospondyli*, the *Eventognathi* or carp tribe, and the *Gymnototi*. Of the last tribe, the electric eels, we have no examples; the *Hemibranchii* or half-gilled fishes, chiefly consisting of the small tribe of sticklebacks, too small for use as food, and of the *Fistularians*, need not here be considered; and the *Syngnathini* or gar-pikes, and the *Haplomi* do not occur in our markets. Representatives of the other suborders, which, after all the other classes, orders, and suborders are taken away, still include far the greater proportion of the families, genera, and species of gill-breathing vertebrates, are numerous here as in most other parts of the world. A noticeable feature of the California fish fauna is the almost total absence of *Acanthoptercous* or spiny-finned fishes from the fresh-waters, which are stocked almost wholly by the *Salmonidæ* (a family of *Isospondyli*), and by the *Eventognathi* or throat-jawed fishes.

ORDER TELEOCEPHALI.

Bony fishes with terminal mouths, the maxillaries and intermaxillaries distinct, and well developed pectinated (or comb-like) gills; gill openings in front of pectorals and comparatively wide; and a sub-operculum (this bone is absent in the order *Nematognathi*). Scales usually present, and generally cycloid or ctenoid.

SUBORDER ACANTHOPTERI.

Telocephali normally with ctenoid scales, a spinous dorsal fin, either separate, or forming the anterior portion of a single dorsal; one or more spines in front of the anal, and an articulate first ventral ray. One or other of these characters often fails, but a constant character is the absence of the ductus pneumaticus, or tube connecting the swim-bladder with the gullet.

PERCID.E.

This large group of typical *Acanthopercous* fishes, with spinous fins and highly ctenoid scales, is, by some naturalists, divided into several families or sub-families, two of which, the *Serranidae* and the *Centrarchidae*, each send to our markets a single representative, the first occasionally, the second with tolerable regularity.

Archoplites interruptus, Girard, Sacramento River Perch — This species is abundant along the lower course of the Sacramento and San Joaquin Rivers, and in all branches of those rivers that permeate the low lands, and forms an important article of food not only to the white inhabitants of the district but also to the Chinese, who are particularly fond of it, catch it in immense numbers and forward it to their countrymen along the railroad, as far as the boundary of the State, or even beyond it. It is usually taken in fyke-nets, which are most effective engines of destruction. It is a very good fish for the table, unless taken in sloughs that, by the falling of the water, have become disconnected with the river. During the winter months this species was rarely brought to the markets of San Francisco, but from February to September it has been of constant occurrence. Although usually known as the Sacramento River Perch, it is by no means confined to that river and its tributaries. Professor Jordan (Bulletin, United States National Museum, 10, p. 34) gives "streams of the Pacific slope" as its habitat; the Museum of California Academy of Science has a specimen from the Pajaro River, and Mr. Livingston Stone states that it occurs in Clear Lake. This species belongs to the *Centrarchidae*, a group which includes the numerous species of "sun-fishes," or "pond fishes," numbering altogether (according to Professor Jordan) sixteen genera and sixty species. The headquarters of this family is in the Mississippi Valley, and the present is the only species known in California. The *Serranoid* fish, previously alluded to, is *Stereolepis gigas*, Ayres, more commonly called the Jew-fish. Monterey Bay appears to be the most northern point ordinarily frequented by this fish, which attains the immense weight of from four to five hundred pounds, and is a most delicious food fish—superior, as I am assured by those who have tasted it, to any of the rock-fishes. Very rarely it has been taken in San Francisco Bay. The range of this species extends to New Zealand.

THE ROCK-COD OR ROCK-FISH.

Under these names are included the various species of *Chirus*, *Sebastichthys*, *Sebastodes*, *Ophiodon*, and *Scorpanichthys*, many of which are caught within the bay, others at various points along the coast, especially towards the north.

The genera enumerated belong to the old family *Triglidae* or *Sclerogenidae*, the latter name meaning "mailed cheeks," and referring to the extension backwards of the suborbitals and their union with the preopercula. On account of the considerable structural differences which distinguished the sections or sub-families of this large family, it is now usually divided into several distinct families, and our rock-

fish belong to three of these, namely: *Chirus* and *Ophiodon* to the *Chiridae*, *Sebastichthys*, and *Sebastodes* to the *Scorpenidae* and *Scorpenichthys* to the *Cottidae* or Sculpins. The members of the genus *Chirus* may be readily distinguished from the others by their comparative smoothness, and the presence of several lateral lines of pores. *Sebastichthys* and *Sebastodes* have an armature of spines upon the top of the head and the edge of the preoperculum, and thirteen spines in the dorsal fin; *Ophiodon* has small scales, a smooth head, a scarcely spinous preoperculum, and twenty-six dorsal spines; while *Scorpenichthys*, like most of the species of the family *Cottidae*, is scaleless and has a depressed head with various spines and flaps. The flesh of these fishes is firm and nutritious, but rather dry, lacking the delicacy of some of the *Pleuronectidae* and the richness of the salmon.

Several of these species were described by Dr. Ayres, in the Proceedings of the California Academy of Science, volumes 1 and 2; and although, in some cases, his notes are antedated by those of Girard Pacific Railroad Report, volume 10, the Californian naturalist may still claim to be the first to introduce six of them to the scientific world. Two species observed by Dr. Ayres I have not yet observed in the markets; these are *Sebastichthys elongatus* and *Sebastichthys ovalis*. The first I am acquainted with only by the specimens in the Museum of the California Academy of Science; the second I have not yet recognized.

CHIRIDÆ.

All the fishes of this family have small scales, ctenoid or cycloid, a long, continuous dorsal, or two dorsals, and an elongated, rather compressed form. The head is spineless. Exclusively marine.

Chirus constellatus, Girard, Constellated; *Chirus guttatus*, Girard, Spotted—The fishes of this genus appear in the market in greater or less abundance throughout the whole of the winter, spring and summer. They are usually taken in the bay. Many of the fishermen and dealers call these fishes sea trout; others do not distinguish them from the various species of *Sebastichthys*—the names of rock-fish or rock-cod serving alike for all. *Constellatus* may be known by the more or less perfect circles of small round spots, inclosing a lighter area, that diversify its sides, while *C. guttatus* is covered with small yellow blotches, sometimes arranged in irregular rows. These light blotches become darker on exposure to the air. *Constellatus* may also be distinguished by the spotted pectoral fin. *C. pictus*, the painted sea trout, is not so often seen as the two previously mentioned, although it is taken in the bay. *C. nebulosus* is also sometimes brought to market, as the Academy of Sciences possesses a specimen bought there. *C. pictus* may be identified by the rich reddish-brown spots and blue cloudings upon its sides, and by the pectorals, alternately barred light and dark. *C. nebulosus* is dark above, lighter below, the two colors showing a tendency to form bands on the sides. All these fishes are peculiar in having several lateral lines along the sides instead of one, as is usual among fishes. The length of full-grown individuals is from twelve to sixteen inches.

Ophiodon elongatus, Girard, Green Rock-cod—This is one of the largest and commonest of our marketable fishes, attaining a length of over three or even four feet, and is usually in great part of a lively green color, spotted or clouded with light brown. But the

coloration of the adults varies greatly. The brown markings sometimes cover almost the entire fish, and different shades of brown occur in the same individual. The young is spotted with round spots of a light yellowish-brown, and it was to the young that the name *Ophiodon elongatus* was originally given by Girard, who described the adult with the title of *Oplopoma pantherina*. *Ophiodon elongatus* was said to have a continuous dorsal, with twenty-seven spines and no membranous flap upon the forehead, while *Oplopoma pantherina* was characterized by two separate dorsals, the first with twenty-five spines, and by the presence of a membranous flap. Dr. Steindachner corrects this error (*Ichthyologische Beiträge*, No. III.), and proves that the continuous dorsal and membranous flap are characters of the species.

The correct number of spines is twenty-seven, but the adult frequently comes to market in a dilapidated condition, with the spines torn apart from each other, or even broken away, and it is most probable that Girard described his *Oplopoma pantherina* from such a mutilated specimen. Young and half-grown individuals are common in the Bay of San Francisco, but the larger examples are taken in tolerably deep water, outside of the bay, especially in the vicinity of the Farallones. Steindachner gives the range of this species as from Sitka to Monterey. This is a highly carnivorous fish. The fishermen describe it as the terror of the inhabitants of the rocks; the other fishes hide for fear of it, and are often seized off the hooks by it.

Another *chiroid*, not usually called a rock-fish, is *Anoplopoma fimbria*, a species which, though rare in our markets, except in September and October, is of more common occurrence northwards, and occurs also along the northern coast of eastern Asiatic Russia. Examples sold here seldom reach a length of more than twelve or occasionally sixteen inches.

SCORPÆNIDÆ.

The sea-scorpions are easily recognized by their ctenoid scales, spinous heads and gill-covers, and single dorsal fin. The union of the dorsals and the presence of true scales, always spinous on their free margins, distinguishes this family from the *Cottidæ*: while the larger head, the armature of spines, the usually stouter body and the rougher scales, distinguish it from the *Chiridæ*. Exclusively marine; of wide distribution.

Sebastichthys flavidus, Ayres, Gill, Yellow Rock-cod—This is one of the most abundant of the rock-fishes, equaling in this respect *ruber* and *pinniger*. It may be known by the greenish-brown and yellowish-green tints of the back and sides, as well as by the third anal spine, which exceeds the second in length, instead of only equaling it, as in *Sebastichthys melanops*. The spines upon the top of the head are not large. In size it equals *Sebastichthys melanops*. Those brought to market are taken outside the bay.

Sebastichthys pinniger, Gill, Smooth Red Rock-cod—This species was first noticed by Ayres (Proceedings California Academy of Science, 11, 1862, p. 207), but was, by that ichthyologist, wrongly identified with the *Sebastichthys rosaceus* of Girard. It became, therefore, necessary to rename it.

Sebastichthys pinniger appears to attain a larger size than any of the other nearly related rock-fish, except *Sebastichthys ruber*, which it usually equals in length but not in weight, as it is of more slender

proportions. In weight it seldom, if ever, exceeds fourteen pounds. It is not taken within the bay. In color it is far from uniform, the upper portion of the head and back being blotched with a darker red than the ground tint, inclining to brown. The spines upon the upper surface of the head are small and inconspicuous, and the paired fins long, the ventrals extending beyond the vent, and the pectorals to within four scales of the first anal spine.

Sebastichthys melanops, Girard, Black Rock-cod—This fish does not usually attain so large a size as *Sebastichthys ruber* or *Sebastichthys rosaceus*. It is one of the commonest kinds of rock-fish, occurring in the markets almost every day throughout the year. The back of this fish is almost black, inclining to purple, the fins are dark purple, and the sides blotched with purplish black. Besides those taken in the immediate neighborhood of San Francisco, large quantities are sent from Monterey and other localities.

Sebastichthys rosaceus, Girard, Pink-spotted Rock-fish—The species thus named is not the *rosaceus* of Dr. Ayres, who identified Girard's *rosaceus* with what has been proved to be a new species, the *Sebastichthys pinniger* of Gill; but it is identical with the *Sebastes helvomaculatus* of the former naturalist. It is smaller even than *Sebastichthys nebulosus*, not equaling it in length and of much more slender form. The three elongated pink spots along each side are constant, and at once distinguish it from every other species. In color it resembles *Sebastichthys ruber*. Though not so common as *Sebastichthys auriculatus* or *Sebastichthys melanops*, or even as *Sebastichthys nebulosus*, *Sebastichthys ruber*, or *Sebastichthys pinniger*; it is brought in in considerable numbers. In length it very seldom exceeds twelve inches. It is probable that this species is identical with *S. oculatus*, Val.

Sebastichthys nigrocinctus, Black-banded Rock-cod—This species is reddish-yellow, with five or six nearly vertical, broad, cross bands, and usually two or three short bands radiating from the eye; but these bands are much more developed in some specimens than in others. It is one of the rarest of our edible fishes, as only single individuals are brought to the market at considerable intervals of time. It is not taken inside the bay. In size it is about equal to *Sebastichthys melanops* or *Sebastichthys flavidus*. There is no mistaking this fish, with its conspicuous black bands across a reddish ground, for any other fish in our markets.

Sebastichthys ruber, Ayres, Rough Red Rock-cod.—This, the largest of the genus occurring in our waters, is stated to reach, though rarely, a weight of twenty-five pounds. It is of a uniform bright red, very different from the brownish red mingled with orange red which forms the livery of *Sebastichthys pinniger*. In form it is stouter than *Sebastichthys pinniger* but less so than *Sebastichthys nebulosus*. It is usually taken outside of the bay, usually from deep water around the Farrallone Islands. It occurs also northward at least as far as Humboldt Bay. By the uniformity of the color, the abundance of supernumerary scales on the large scales, and the peculiar shape of the preopercular spines, this species may readily be distinguished from *Sebastichthys pinniger* as well as from *Sebastichthys rosaceus*, the latter of which strongly resembles it at first sight. The three pink spots of *rosaceus* are, however, a constant character by which it may be known from young individuals of *Sebastichthys ruber*; and the

smooth surface of the head in *Sebastichthys pinniger* distinguishes it as readily from the same species.

Sebastichthys auriculatus, Girard, Black-shouldered Rock-cod—This is rather a small species, seldom exceeding eighteen inches in length, and is brought to the markets in great abundance, probably on account of its common occurrence in the bay. Not only does this species occur, together with two or three others of the smaller kinds of *Sebastichthys*, and the young of the larger kinds, in the deeper portions of the bay near the entrance, but it is also abundant along the eastern shore of the bay where no other species of the genus is found, probably on account of the admixture of fresh water from the Sacramento River. This fish can always be distinguished by a black mark upon each of the gill-covers, very obvious in the younger fish, and sufficiently distinct, though less clearly outlined, in older specimens. The general color is a dull reddish brown with cloudings of a darker tint upon the back and sides; these cloudings, like the black spot before mentioned, becoming more diffused and indistinct with increasing size and age. This is another of the kinds which must eventually become scarcer, unless some means be taken to prevent waste. Small individuals, four to six inches long, are brought to market in great numbers from various parts of the bay.

The lower jaw in *Sebastichthys auriculatus* projects but slightly, contrasting broadly with that of *flavidus*, and most of the other species of the genus.

Sebastichthys nebulosus, Ayres, Clouded Rock-cod—This is one of the smallest of our rock-fish, yet is heavier by far than individuals of other species of equal length, on account of the stoutness of its form. It seldom attains a length of more than eleven or twelve inches, though it occasionally reaches eighteen inches, and seven pounds is the greatest weight ever attributed to it. Some of the specimens have a broad yellow band along each side, and are also adorned with yellow blotches of variable form and size: but in others this band, which doubtless suggested to Girard his name of *fasciatus*, is absent, and the dark and light tints of the sides are mingled together without any approach to regularity or beauty. In this species the lower jaw does not project as in most of its tribe, but is even with the upper. It is one of the most abundant of the rock-fish.

Sebastes paucispinis, Girard, Gill, Small-scaled Rock-fish—This species may readily be distinguished from all the species of *Sebastichthys* by the smaller size of the scales, as well as by the straight dorsal outline and the extreme elongation of the lower jaw, the tip of which extends upwards to the line at the top of the head, and forms part of its upper outline. The spines upon the head are very little developed. This is one of the rarest of our food fishes, occurring in our markets only at considerable intervals, and in small numbers. In color it is reddish brown on the back, as well as on the dorsal and caudal fins; the tint becoming lighter but more decidedly red on the sides and abdomen. In size it exceeds many of its relations, as most of those brought to market reach or exceed two feet in length.

COTTIDÆ.

Spinous dorsal shorter than the soft dorsals, separate body without true scales, but often with prickles or scale-like plates.

Scorpenichthys marmoratus, Girard, Large Red Sculpin, or Bull-head—Despite the absence of scales upon its body, this species is commonly styled a rock-cod. While its nearest relations, the smaller sculpins, or catfish, as they are often called here, are thrown away by the fishermen, this large sculpin is allowed a place among our food fishes. *A priori* one would expect the other sculpins to be good food, and I am assured by those who have tried them that they are; all they need is skinning before cooking. Although tolerably common within the Bay of San Francisco, and very frequently taken by the angling fraternity upon Oakland wharf and in similar situations, this species is only occasionally brought to market, and then only in small quantities.

Under the name of *Hemitripterus marmoratus*, this species was described by Dr. Ayres, in the Proceedings of California Academy of Sciences, vol. 1, p. 4.

Scorpenichthys marmoratus is sometimes called a rock-cod, at others a bull-head; the latter name being also applied to other *cottoids* with depressed heads. It reaches a length of two feet or more. Several smaller *cottoids* are brought to market occasionally, more by accident than design. These are *Hemilepidotus spinosus*, a species with four bands of scales; *Leptocottus armatus*, the common yellow sculpin of the Bay of San Francisco, *Aspicottus bison*, *Artedius lateralis*, *Artedius pugettensis*, and a species, probably new to science, which I have described under the name of *Artedius quadriseriatus*. None of these are used to any extent as food, yet *Leptocottus armatus* is sufficiently common in this bay to be so used, if the prejudice against its appearance could be conquered.

SCICENIDÆ.

In this family the body is compressed and rather elongated; dorsal fins, two sometimes slightly connected, the first consisting of not very strong spines, and less developed than the second, or soft dorsal; teeth of the jaws in villiform bands, none on the vomer, or palate; scales ctenoid, but not very strongly so. Other characters are a continuous lateral line, generally one or two anal spines; the presence in most cases of barbels, or pores, under the chin; bones of skull more or less cavernous; and usually a large air bladder. Chiefly marine.

Atractoscion nobilis, Ayres, Gill, Sea Bass—This is one of the most valuable of our food fishes, since it grows to a large size, and is of most excellent flavor. Its usual dimensions are those of an ordinary salmon, but it frequently attains a larger size, a large individual reaching a weight of seventy or even ninety-five pounds, and a length of five feet. It is taken in the bay, and at various points along the coast, north and south. Ayres states that Captain Scammon found it abundant as far south as latitude 27°. In our markets it is sometimes plentiful, but the supply is very uncertain, even when it is in season. During the months of November, December, and January, to February 20th, I did not meet with a single individual, but in October, and from March to September, it has been of tolerably frequent occurrence. "Sea Bass," boiled and baked, is a constant dish at the restaurants of the city, but examination shows that much of that sold at the cheaper restaurants is sturgeon. In color, it is of a clear grayish blue, with metallic blue and golden reflections on the

fore part of the body, and on the head, when fresh; the sides are lighter. The first dorsal fin has ten spines; the second, one spine, and twenty-two articulated rays.

Genyanemus lineatus, Gill; *Leiostomus lineatus*, Ayres; the King-fish—This species was formerly common in the bay, but since its waters have been defiled with so much tar and drain refuse by our destructive imperfect civilization it has become scarce, and is now usually obtained outside. It is, in my opinion, one of the most delicate of our food fishes, and, fortunately, is still abundant, occurring in greater or less numbers in our markets throughout the year. In size it does not greatly exceed a herring, average individuals measuring six to eight inches in length. Ayres says "it seldom exceeds eleven inches." Other names for this species are little basse and cognard. The wavy lines of browner tint which run obliquely along the grayish-brown body are in many specimens not very obvious. By these bars and the obtuse snout, under which the lower jaw is received, this species may readily be known from the next.

Seriphus politus, King-fish.—This fish, known by the dealers by the same name as the last, but readily distinguishable from it by its longer head, much longer lower jaw, shorter spinous dorsal and more silvery tint, scarcely deserves, on account of its rarity, to be mentioned among our food fishes, yet is taken within the Bay of San Francisco. I have never seen more than one or two in the market at once.

LABRIDÆ.

This is the leading family of a group which, in consequence of the coalescence of the two lower pharyngeal bones into a single tooth-bearing bone, has received the name of *Pharyngognathi*, and has been by many naturalists raised to the rank of an order. As, however, examples of the union of the pharyngeal bones may be found among fishes differing widely from each other in other structural points, this single character is not now usually believed to be of ordinal value; yet the *Labridæ*, the *Embiotocidæ* and several other families nearly united in other respects, form a natural super-family or section of an order. The *Labridæ*, as their name indicates, are characterized by having the lips, which in most fishes are thin and inconspicuous, well developed and thick. The scales are large and cycloid; a lateral line is present, but in most cases is interrupted in its course, and the spinous dorsal varies considerably in its development.

This family is sparsely represented on our coast. *Pimelometopon pulcher*, Gill, *Labrus pulcher*, Ayres, is occasionally brought to market in the autumnal months from more southern points, but is rare. It attains a length of over two feet, and may at once be recognized by its conspicuous livery of black and red, the former occupying the head as far as the pectorals, as well as the posterior portion of the body, the latter a broad transverse band from the pectorals to behind the anal. The pectorals, ventrals, caudal and dorsal are black. *Oxyjulis modestus*, Girard, Gill, a smaller species, is of still rarer occurrence, but becomes commoner in the more southern parts of the State.

EMBIOTOCIDÆ.

Ever since the first discovery of these fishes they have been objects of great interest to ichthyologists, chiefly on account of their peculiar method of reproduction. While by far the greater number of the true fishes are simply oviparous, that is, deposit their fully formed ova upon the bottom of the river or sea which they inhabit, some few are ovo-viviparous, the eggs being retained in the interior of the ovary and hatched there. Prominent among these is the well known

Zoarces anguillavis, or viviparous blenny; but in the *Embiotocidæ* we have a family of considerable size, all the members of which bring forth their young alive and fully formed. The interior of each ovary is divided by highly vascular membranes into longitudinal compartments, in which the young are systematically arranged; and no better idea of the appearance of an ovary thus packed with living young can be formed than by comparing it with the interior of a pomegranate, the pips representing the young, and the partitions those dividing the ovaries. Only it must be remembered that there are of course no transverse partitions in the ovary of an embiotocoid, as in that case there would be no means of exit. The appearance, however, is similar to that of the fruit, as the longitudinal membranes form a fold between each embryo. Between the ventral fins and the vulva there is a scaleless space upon the abdomen, forming a sort of sheath or fold, usually concealed by the projection of the scales of the sides. The shape of these fishes is not unlike that of the sunfishes or pond perch (*Centrarchidæ*), or of the sheep's head and porgee of the Atlantic; but the scales are cycloid or smooth, and rather large; the lips well developed (in some cases excessively thick), and the mouth very extensible, characters which prove a rather near relationship to the *Labridæ* or Wrasse family. The cheeks are scaly, and a narrow sheath of scales extends along the base of the soft dorsal. During the winter months the supply of these fishes was comparatively small, and chiefly confined to the kinds which inhabit the bay, but during April and May the supply has been very abundant, the species constituting the bulk of the catch being *Embiotoca jacksoni*, *Embiotoca lateralis*, *Hypsurus caryi*, *Holconotus rhodoterus*, *Phanerodon furcatus*, *Rhacochilus toxotes*, *Damalichthys vacca*, and *Hyperprosopon argenteus*. Most of those brought to market are females, full of young, and it is safe to say that at least twenty perfectly formed young fishes are killed for every adult taken at this season. The greater part of the spring supply comes from the north of our bay, near Tomales Bay; and some of the kinds found in our own bay all the year round are not largely represented. Among these are *Amphistichus argenteus*, *Cymatogaster* (*Micrometrus*) *aggregatus*, and *Abconia minima*, the latter the "shiner" of the angling fraternity, and the only one of the marine species of the group which is too small to be of much value for food. As the habits of this tribe of fishes are not well known, I will only suggest the desirability, for the sake of ensuring the permanence of the supply of a group which is only second to the salmon in its importance as an article of food for the people of this coast, of some legislative regulations which may give the females a chance to perpetuate their race before they are taken. How to do this I do not venture to say, as I do not know whether many of the species are procurable at any other than the season of reproduction, and I here ask all who have leisure to investigate the matter, to endeavor to ascertain at what season the various species of this tribe seek the shallower water, and whether they are to be found at other seasons in such localities that they can be taken.

Unless some means is found of protecting some of the more useful and abundant of our fishes, so that they may have a chance to reproduce their kind; our supply of fish, even now too limited for the demand, will, in a few years, dwindle to next to nothing. Our bay will be "fished out" as many a river and bay in Europe has been

fished out, and one of our most important sources of food supply will be dried up. The peculiar mode of reproduction of these fishes not only render them of considerable scientific interest, but the young, hatched perfectly formed, and able to take care of themselves from the moment of their exclusion from the oviduct, have many more chances in the struggle for life than those of ordinary fishes; and with a little care on our part it is probable that an abundant supply could be maintained. We take the ova of the shad and the salmon, and by careful watching and tending hatch the young, which we then put into the rivers to take their chance; but in this tribe of fishes nature does all this work for us, and all we have to do is to let the young fish get away safely, as far as we are concerned.

I have mentioned by name eleven species, but these are not all. About eighteen kinds are known, one of them a native of Japan, the others all from this coast; one, *Hysterochampus traskii*, Gibbons, is found in the fresh waters of our State, but all the others are marine.

The Embiotocidæ are a difficult family to study, not only because of the anatomical peculiarities which need fuller investigation, but on account of the confusion into which the nomenclature has fallen. Various species were, about 1854, described almost simultaneously by Agassiz and by Dr. W. P. Gibbons, of Alameda. Shortly after, Girard, in the Pacific Railroad Report, described several species, most of them identical with those described by the two former naturalists. Each of these writers gave a different name to the same species; this was unavoidable in the case of the first two naturalists. But Girard, coming after the others, chose also to re-describe them giving at the end of his work on the family a list of Dr. Gibbons' species which he states he could not recognize. He who undertakes to write scientifically upon this group has now to disentangle the maze of synonymy, and also to determine which of the numerous genera have characters which entitle them to recognition, and all this means a great deal of hard and unattractive work.

These fishes are commonly known as "perch," although some of the species have been honored with distinctive titles.

Embiotoca jacksoni, Agassiz, the Pogy or Black Basse—The pogy, black basse, or black perch, as it is variously called, on account of a supposed resemblance to fishes not very nearly related, is perhaps the best known of the family. At the same time it is one of the most difficult to distinguish, on account of the difference of color between the male and female, and between the young and the adult. Thus the *Embiotoca cassidii* and *Embiotoca webbi* of Girard are only partially grown black perch. The female is of a deep dark purplish-brown, with the vertical fins and ventrals of a bluer purple; but the male is much lighter in tint. The young have transverse bands across the body, a peculiarity which is common to the young of the whole family, but persists in the adults of some species. These bands are in all cases darker than the ground tint. Some individuals have the vertical fins decidedly violet. There are four rows of scales upon the cheek. Girard gives the number of young in the two ovaries as about sixty. This species is tolerably common in the Bay of San Francisco, and abounds in Tomales Bay; and is brought to market more or less abundantly throughout the year. It is one of the largest of the family, attaining a length of fourteen or fifteen inches, and a weight of from three to four pounds.

Teniotoca lateralis, Agassiz, Blue-banded Perch—By the peculiarity

embodied in the English name I have ventured to apply to it, this fish may at once be known from the other species of the family. The sides are banded with numerous longitudinal stripes of purple, and the head is adorned with various bluish marks. Like *Embiotoca jacksoni*, it is found both in San Francisco and Tomales Bays. It attains very nearly as large a size as the former species, and it is brought to our markets at all seasons of the year, though less abundantly in the winter than in April and May. As in the last species, the young differ in their coloration from the adult, being usually lighter and more brightly colored, and this has been the cause of the description of nominal species.

Hypsurus Caryi, Agassiz, the Orange-banded Perch—This, one of the most beautifully tinted of the family, is either not found in this bay or is very rare there, as only occasional specimens occurred in the markets during the winter months. Large quantities of this species have been brought from Tomales and its vicinity during the months of April and May; it is not a large form, exceeding in this respect the species of *Hyperprosopon*, but falling far behind either of the previously mentioned kinds. The largest I have seen was not more than twelve inches long, and the average length is about ten inches. It may be at once recognized both by its coloration and by its form. The species most nearly resembling it in color is *Embiotoca lateralis*, but in the present species the blue streaks are mingled with orange, which latter tint predominates upon the abdomen, the back is richly bronzed; the dorsal, caudal, and anal are irregularly banded with orange and white; the pectorals are of light golden; there is a black blotch on the anterior part of the anal, and the ventrals are tipped with black. But the form of the body is still more distinctive. The anal fin is formed of fewer rays than in the preceding species, and these rays are crowded into a short space and directed horizontally backwards, their base being directed upwards at an angle of about 60° from the horizontal. The space between the ventrals and anal is thus longer than in the other *Embiotocidæ*, this, together with the short, horizontally, directed anal, and the straight line formed by the abdominal outline, give the fish a peculiar appearance. The teeth are few, four to six in the upper and nine to twelve in the lower jaw. All the examples I have seen in May were females with their ovaries full of young.

Phanerodon furcatus, Girard—Extremely abundant in the markets during the summer and autumn, the supply coming from Tomales Bay. This is one of the most uniformly colored of the *Embiotocidæ*, the prevailing tint being that of burnished silver. The older individuals are darker above, and the dorsal and caudal have a darker margin. The dorsal spines increase in length to the last, which is almost as long as the first ray; the anal is long and low, and the caudal peduncle narrow. *Phanerodon furcatus* seldom reaches a length of more than twelve inches, and as it is a slender and rather thin species, its weight seldom exceeds one pound.

Damalichthys vacca, Girard—In general form this species closely resembles the thick-lipped perch, but may at once be distinguished from it by the want of the thick lips. I first noticed its presence in the markets in the month of February, and from that time to October it has been tolerably abundant. Most of those I have seen were about a foot in total length and about four inches in width across the body; but the species attains a weight of from three to four

pounds. In color it is slaty-gray, becoming more silvery on the sides and silvery-white below, without any conspicuous marks or bands. The second ray of the soft dorsal is twice the height of the last and highest spine of the spinous portion of the same fin.

Rhacochilus toxotes, Agassiz, Thick-lipped Perch—This is the finest and largest of the tribe, attaining a length of sixteen or eighteen inches, and a weight of from five to six pounds. It can be at once identified by the great thickness and prominence of its lips, especially the lower lip, which forms a broad, continuous fold around the lower jaw. The greatest width is about a third of the total length. The caudal peduncle is long and the spinous portion of the dorsal fin much lower than the soft portion. The teeth are few, and in a single row. The coloration of the fresh fish is not conspicuous, as it is chiefly a bright silvery-gray, becoming darker and metallic on the back, with a reddish tinge posteriorly, and dark and dull on the top of the head. From April to September this species has been of tolerably common occurrence in the markets, though by no means so abundant as *lateralis*, *caryi* or *Hyperprosopon argenteus*. It is usually sold at a higher price than the other perch. Those brought to market in the months named are caught in Tomales Bay.

Micrometrus aggregatus, Agassiz; *Cymatogaster aggregatus*, Gibbons, Large Shiner—This is one of the kinds ordinarily found in San Francisco Bay, brought to market, though not in abundance, throughout the year, and frequently taken by anglers. It does not attain the dimensions of the *Embiotoca jacksoni*, *Embiotoca lateralis*, or *Rhacochilus toxotes*. The scales of this species are comparatively large, the lateral line containing only from forty to forty-four. The longest spines are longer than the rays of the soft dorsal, and the sides have eight or nine longitudinal bands, formed of black dots. The young have three or four vertical bands.

A still smaller species is the *Micrometrus minimus* of Gibbons, *Abeona trowbridgii* of Girard, and Shiner of the small boys, who usually contemptuously fling it back into the bay whenever they take it. Its presence in the market is only accidental, among the heaps of small flat-fishes or smelts.

Hyperprosopon argenteus, Gibbons, Large-eyed Perch—The large eye; the upward turned mouth; the lower jaw extending to, or even beyond, the horizontal from the upper margin of the pupil; the broad short body, the shape of the spinous dorsal, the fourth spine of which is the longest, and longer than the soft dorsal; the silvery color, and the black-tipped ventrals, render this easily recognizable from all the other *Embiotocidæ* except the rarer *Hyperprosopon agassizii*, *Hyperprosopon arcuatus*, and *Hypercritichthys analis*. The first of these is known by the absence of the black tips to the ventrals, and the presence of a black margin to the caudal; the second by the greater curve of the back, less depressed forehead, smaller eyes, and shorter lower jaw; and the third by the considerably smaller eye, more elongate body, shorter dorsal and anal, and the presence of a black spot in the middle of the caudal. The large-eyed perch is common in San Francisco Bay, and during the months of April and May is brought in large quantities from Tomales Bay. It is smaller than most of the preceding species, the length seldom exceeding nine or ten inches, and the weight about half a pound.

In this genus the teeth form a single row extending all around the lower jaw, and about half way along the upper, thus differing from

Embiotoca, *Hypsurus*, and *Rhacochilus*, which have only a few teeth in each jaw, and from *Micrometrus* and *Amphistichus*, which have a double row.

The present species, together with *Hyperprosopon agassizii* and *Hyperprosopon arcuatus*, differ considerably in form from the rest of the family, as the greatest width is contained in the total length to the tip of the caudal only two and a half times.

All these brought to market in May, so far as I have observed, are females, with the ovaries full of young; but this species is taken at all seasons of the year.

Holconotus rhodoterus, Agassiz, Red-fin Perch—This is another of the kinds which inhabit the Bay of San Francisco. It may be readily identified by the reddish color of the fins, while the shape of the spinous dorsal, which is highest in the middle, differs from that of all the other *Embiotocidæ* except those belonging to the genus *Hyperprosopon*, from which the smaller eye and more elongate form at once distinguishes it.

As is the case with most of the species of *Embiotocidæ*, the supply of this fish is very irregular. After weeks during which it either does not occur or is very rare, it will suddenly appear in the market in great abundance, forming a large proportion of the total catch of perch.

Amphistichus argenteus, Agassiz, Silver Perch—This is another of the species common in the bay. From *Micrometrus aggregatus* it may be known by its much smaller scales, and by the persistence, in the adult, of transverse bands upon the body; and from *Hyperprosopon argenteus* by its smaller eye and more elongated form; and from *Holconotus rhodoterus* by the lower spinous dorsal. In length it seldom exceeds ten or twelve inches, and the largest individuals attain a weight of two pounds or a little more. The fifth dorsal spine is slightly longer than the last, which is a little shorter than the anterior articulated rays.

SPHYRENIDÆ.

Sphyræna argentea, Girard, the Barracuda—It is well not to be misled by English names. That of barracuda is applied not only to all the species of *Sphyræna*, of which there are several, but also to fishes of other families, and even other orders. In the rivers of South America the name is given to the *Sudis (Arapaima) gigas*, a soft finned, large scaled, fresh water, carnivorous fish. All barracudas, however, are fierce, rapacious fishes, and the one we are at present considering attains a length of over three feet, and a weight of from twelve to fourteen pounds. The form is slender, but it is nearly as thick as it is deep, and its jaws are armed with a formidable row of sharp teeth. When darting through the water it looks like a silver arrow. It is usually obtained south of the bay, and at the Farallones, but occurs at least as far north as Tomales. Its flesh is very good eating, so that if it devours our food fishes we may console ourselves by devouring it.

I am informed that this fish has never been known to occur in the bay. This fish may at once be recognized by its long, cylindrical shape, elongate head, cycloid or smooth scales; first dorsal fin of five spines only, the second spine highest, and second dorsal, of eleven rays, placed far behind the first dorsal. This species is the only rep-

representative on this coast of the family *Sphyrænidæ*, which consists of the single genus *Sphyrna*.

SCOMBRIDÆ.

The five following species belong to this family, as defined by the older writers, including the *Stromateidæ*, *Carangidæ*, and other tribes not represented here. None of them are caught, except rarely, near San Francisco, and most are highly prized, both on account of their rarity and their quality. In all the scales are very small and smooth, or are absent; the color is steely blue, lighter below, and the caudal is broadly bilobate. The three first noticed are true *Scombridæ*, and have several small finlets behind the dorsal and anal fins.

Scomber colias, Spanish Mackerel—The *Scomber diego* described by Ayres (Proceedings California Academy of Science, vol. 1, 1857, p. 92) has been proved by Steindachner to be identical with the long known *Scomber colias* or Spanish mackerel of the European seas. Steindachner states that it occurs frequently on the coast of the Galapagos Islands, and wanders in small shoals along the Californian coast as far as San Diego, also that single individuals occur near San Francisco. Thus this species and *Albula vulpes* are among the few fishes which inhabit both the Atlantic and the Pacific Oceans. On one occasion only, in April of the present year, I found this species in the market in tolerable abundance, and it has again occurred in September. Those which were then exposed for sale were small, not above eight inches long, and came from Monterey Bay. The identity of Ayres' *Scomber diego* with *Scomber colias* has been confirmed by a comparison of Ayres' original specimen with the diagnosis given by Günther. (Catalogue of Fishes, British Museum, II).

From the two succeeding species this may be readily known by the presence of only five finlets behind the dorsal and anal fins; by the spinous dorsal of seven spines; and by the irregular reticulated dark lines upon the back.

Sarda lineolata, Girard—This, like all the Pacific Coast *Scombridæ*, is not very often brought to the markets of San Francisco, except in September and October. They are usually caught in Monterey Bay.

Günther (Cat-fish, British Museum, II, 368) considers this species to be identical with the *Pelamys chilensis* of Cuv. and Val. It attains a considerable size, a series of four specimens lying on the stalls measuring respectively two feet, two and a quarter inches; two feet, two and three-quarter inches; and two feet, three and a half inches, from tip of snout to fork of caudal fin. The caudal fin cannot be said to be crescentic, as stated by Girard, since its posterior margin form two sides of an obtuse isosceles triangle. The sides and belly are silvery, becoming bluish-black towards and on the back, and five or six obliquely longitudinal bands of the darker tint run along the sides.

From November to the end of May this species has not occurred in the markets. Appearances indicate that this and some other *Scomberoids* take a run northwards in the autumn, and thus reach the San Francisco markets from Monterey. The patch of larger scales behind the pectoral fin, and the oblique, darker streaks upon the sides of the body, serve to distinguish this species from the succeeding one, but the dealers distinguish them also by the texture of the flesh, which is softer in this species than in *Chriomitra concolor*. The first dorsal has eighteen spines, and there are eight finlets behind the dorsal, and seven behind the anal.

Chriomitra concolor, Lockington—In October and November of the past year, my attention was drawn to a *Scomberoid* which somewhat resembled the *Pelamys* (*Sarda*) *lineolata* of Girard, but examination proved not only that it was not that species but that, on account of the absence of a corselet, or patch of large scales behind the pectoral fin, and the want of teeth on the vomer, or palatines, it must be made the type of a distinct genus.

Very few of these fishes were brought in during the autumn—by no means sufficient to supply the demand, for it is in great repute among rich gastronomists, and fetches a high price. Its flesh is said to be far firmer and better than that of *Sarda lineolata*, from which it may be readily distinguished by the characters mentioned above, but also by the absence of the darker, oblique streaks which diversify the flanks of the latter fish. Although most of the individuals sold here are brought from Monterey, I am informed that stragglers have been caught as far north as Tomales. Those which I have seen have averaged about two feet in total length to the tip of the caudal lobes. There are seven or eight finlets behind the dorsal, and eight behind the anal fin. There are seldom more than two or three of this species in the markets at once.

Poronotus simillimus, Ayres, Pompino—This species was first described by Dr. Ayres (Proceedings California Academy, vol. 2., page 84, figure on page 85) in December, 1860, and accompanied by a tolerable outline figure. Dr. Ayres states that in the course of seven years he only saw three or four specimens; but this year at least it is far more abundant, as I have seen as many as thirty or forty on the same stall on many occasions. As with the other *Scomberoids*, the examples brought to this market are usually caught in Monterey Bay, which appears to form the northern limit of many species of fishes, crustacea, and echinoderms. The Italian fishermen call this species "pompino," and this must be accepted, in the absence of any other, as its English name. I am informed that a fish called "pompino," on the Atlantic coast, is considered to be the most delicate of all fishes. This is *Trachynotus carolinus*, a very different species. Our "pompino" is also highly prized as a delicate morsel, and is one of the dearest fishes in the market. This species has been more or less abundant throughout the whole of the winter and spring, but during part of the time the catch has been principally composed of very small individuals, not above three or four inches long, which certainly should not have been caught at all. Most of these small ones are, if I have been rightly informed, taken in the Bay of San Francisco, to which this species is an occasional visitant, and the high price the species commands tempts the fishermen to catch all they can find. An adult pompino measures from eight to ten inches in length. This fish may be identified at once by the total absence of ventral fins, while its thin, broad, oval body, bright steely color, and dorsal fin with only a single spine, are other conspicuous features. It is covered with rather small, smooth scales.

Trachurus symmetricus, Ayres, Horse-mackerel—Authorities differ as to whether this fish is peculiar to this coast or is identical with the *Trachurus trachurus* of Linnæus. Dr. Günther identifies it with the latter, thus making it identical with the European horse-mackerel, which, if his view is correct, is a widespread form, common to both great oceans. Professor Gill does not agree with this view. He says (Proceedings Academy of Natural Science, Philadelphia, 1862, p.

26): "They can be readily distinguished at first glance. The California species has the flexure (of the lateral line) very abrupt and oblique, and the pectoral fin equal to the length of the head before the preoperculum." This fish is only sent occasionally to our market, usually from Monterey, but when it is present it is in greater abundance than any of the other *Scomberoids*. Occasionally it visits the Bay of San Francisco, for the single specimen (seventeen inches long) on which Dr. Ayres founded his species, was taken there, and the dealers assure me of its occasional occurrence. Those sent from Monterey are seldom as large as Ayres' specimen. It is not valued so highly as either of the previous species. From all the other fishes brought to this market it may be readily known by the series of keeled scales along the center line of the hinder part of the body.

BLENNIIDÆ.

This family, as originally composed, consisted of a heterogeneous assemblage of fishes with little in common except a greater or less tendency to an elongate form, with more or less elongate dorsal and anal fins; and ventrals which are either jugular (in advance of the pectorals) and composed of fewer rays than usual, or are absent altogether. They are, by Professor Gill, divided into several families, among which are the *Anarrhichadida* or wolf-fishes; large, ravenous fishes with strong teeth and no ventral fins; *Blenniida* or true Blennies, with ventrals and a long, dorsal fin, formed partly of spines, and partly of soft rays; *Stichæida* or Snake Blennies, with a dorsal composed of spines only, and a compressed, thin body; *Xiphidrontida* or Gunnels, which differ from the last, among other things, in the absence of a lateral line, and the presence of one ray only, in the ventrals; and *Cryptacanthida*, which have the cleft of the mouth nearly vertical, no ventrals, and the dorsal rays all spinous.

To the first of these belongs *Anarrhichthys felis*, Girard, a long snake-like fish, with a large, heavy head—so heavy that if it hang on one side of the hand while the body is on the other, it will draw the body after it—and very strong teeth. It is sometimes brought to market, and attains a length of four to eight feet. The contents of the stomach of a large specimen brought to market, June 10th, consisted entirely of the tests of our common cake-urchin. Another *Blennoid*, occasionally seen in the markets, and reaching a length of more than two feet, is *Cebidichthys cristagalli*, Ayres, a brownish olive fish, with two or three purplish violet bands upon the cheeks, and a crest upon the head (*Cebidichthyidæ*, Gill). The other *Blenniida* brought occasionally to market, are quite small fishes, but *Apodichthys flavidus*, Girard, would make up for its small size by its abundance, if it were at all sought for as an article of food. It attains a length of about a foot, and is frequently found under stones above low-water mark.

A species of the *Batrachidæ*, or toad-fishes, *Porichthys porosissimus*, the only one found on the coast, is common in the bay and at various points up the coast, and is sometimes brought to market in the summer, at which season it resorts to the tide-pools under the rocks, to deposit its ova. It attains a length of about sixteen inches, and may be recognized by the lines of silvery pores on the under side of the body, and the absence of scales.

All the above fishes are used as food by the Chinese of San Francisco.

ATHERINIDÆ.

A small family, with two distinct, small dorsal fins, the first composed of five to seven weak spines; ventrals abdominal; teeth feeble; scales smooth; a silvery band along the sides.

Chirostoma californiensis, Girard, Smelt—This species, together with the following, and three species of small Salmonoids mentioned further on, are all sold in the markets and peddled in the streets of San Francisco under the name of smelt. All are taken in the bay, and all are abundant, but the two *Atherinidæ* are far more so in individuals than any of the Salmonoids sold under that name, and exceed them still more in quantity. The present species is much larger than its relation, reaching a length of seventeen inches, and may be distinguished by its larger head, more slender form of body, larger mouth, and the central position of the first or spinous dorsal. It is probably the most common of the fishes of the bay, *Atherinops affinis* alone rivaling it in this respect. Both species are excellent eating, but in this respect are inferior to the salmonoid smelts sold with them. The two *Atherinoids* may be readily distinguished from the salmonoids by the presence of two dorsal fins, the first very small, placed about in the center of the length of the back, and formed of spines of stiff rays, the second rather larger, and separated by an interval from the first. Their prevailing color is light green, but a silvery band runs along each side.

Atherinops affinis, Ayres, Steindachner—In *Atherinops affinis* the dorsal is nearly its own length further back than in *Chirostoma californiensis*, the form of the body is much stouter, the head proportionally smaller, the mouth smaller, the fins larger, and the flesh firmer. Dr. Ayres states that this species never exceeds eight inches in length, and this size must be but rarely attained, as the specimens I have seen in our markets seldom pass six inches, while *A. californiensis* usually exceeds twice that length. Like the last species it is extremely abundant throughout the year. A large proportion of the small fishes wasted by being thrown upon the shore by the fishermen belong to this species; but mingled with them are the young of the last species, quantities of *Engraulis ringens*, and a proportion of true smelts and small flat-fishes. The Chinese dry these small fry in large quantities, on matting spread in the sun, turning and tending them carefully. When dried they are gathered up, trodden down into large sacks, and exported to the Flowery Kingdom. Not only is the mouth proportionally smaller than in the preceding species, but there is only a single row of teeth in the jaws, each tooth two-pointed.

MUGILIDÆ.

Mugil mexicanus (?), Steindachner—Several specimens of a species of *Mugil*, evidently very close to the above species, if not identical with it, have found their way to our markets in the months of September and October. All of them were taken near Santa Cruz, in the Bay of Monterey.

The specimens examined agree with *Mugil mexicanus* in the number of scales in the lateral line, and of rays in the vertical fins; in the length of the latter, in the produced upper caudal lobe, and in the proportions of the body and head. And I should not hesitate to pronounce them to be of that species were it not that Mr. B. B. Redding, one of the Fish Commissioners for the State of California, has

informed me that about three years ago he placed several (I believe about forty) individuals of a *Mugil* from the Sandwich Islands, in the Sacramento River, and it is, therefore, possible that the specimens obtained may be some of these, or their young. I suspect this because the shad introduced from the East finds its way, in considerable numbers, to Monterey Bay, instead of dutifully returning to the place of its birth, and this *Mugil* may have acted in a similar way; also because the specimens agree tolerably well with the diagnosis of *Mugil cephalotus*, given by Günther. The inter-mandibular spaces agrees pretty well with Günther's figure of that of *Mugil cephalotus*, but it is still nearer to Steindachner's figure of *Mugil mexicanus*. As this is a mullet, it is of course tolerably good eating, but it must be remembered that it is not nearly related to those famous delicate fishes, the red mullet and the surmullet, which were so highly prized by the Romans that they fed them in aquaria, but to the gray mullet. The first mentioned fishes belong to the *Mullidæ*, and are provided with a barbel; the latter and our Californian fish to the *Mugilidæ*, which has no barbel and no teeth worth speaking of. From October to the end of May I have only seen a single specimen, which occurred near the end of April.

The *Mugilidæ*, of which this species is the only representative on this coast, are very near to the *Atherinidæ*, forming with that family Gill's suborder *Percesoces*, or perch-pikes. There are two perfectly distinct dorsals, the first of four weak spines; the ventrals are abdominal; the head is broad; the teeth are extremely feeble, or wanting, and there is no silvery longitudinal band.

SUBORDER ANACANTHINI.

In this suborder all the fin rays are soft and articulated; the scales are cycloid; the ventrals jugular, that is, in advance of the pectorals; and the dorsal and anal fins very long, often divided into two or three portions. The suborder includes several families, the most important of which, to the human species, is the *Gadidæ*, to which the cod, haddock, hake, whiting, and other well-known Atlantic fishes belong.

Other families, members of which are found on this coast, and occasionally brought to the markets of this city, are the *Brotulidæ*, *Ophidiidæ*, and *Lycodidæ*, each of which furnishes a single species.

The Ophidioid of our markets is *Ophidium taylori*, Girard, a small fish attaining a length of about ten inches, and inhabiting the sandy beaches at various points along the coast. It is eel-like in form, with continuous vertical fins, a pair of long bifid filaments (representing ventrals) attached to the base of the tongue between the two rami of the lower jaw; and small teeth on jaws, vomer, and palatines.

The Lycodoid, *Leurynnis paucidens*, Lockington, is still more elongated, but has a much larger mouth and narrower gill openings. Teeth are present upon the jaws only, the ventrals are very small, and the vertical fins continuous.

Both these fishes are excellent as articles of food, and have the additional advantage of the almost entire absence of small bones, but they are not brought to market in sufficient abundance to be of much value.

The Brotuloid is *Brosomphycis marginatus*, Ayres, Gill, a very rare fish, as only two or three specimens occur in the course of a season, but larger than either of the preceding. It may at once be recognized by the continuous margin of red formed by the conjoined dorsal, anal, and caudal fins. Red-fin would be a good English name for it. It attains a length of more than twelve inches, and is less slender than the two preceding species. Of its gastronomical qualities, I cannot speak.

The Gadidæ are represented at this point by the two following species only, as the true cod does not occur so far to the southward.

Merlucius productus, Ayres, Gill, Californian Whiting—Of this species I have as yet seen only a few exceeding fourteen or eighteen inches in length. Dr. Ayres, its first describer, speaks of it as by no means common, but mentions "a few specimens, all taken at the

same time, and from eighteen to twenty-four inches in length." Some of the dealers inform me that it has been scarcer of late years. Certain it is that, except in the autumn, it is of rare occurrence in our markets.

From *Microgadus californicus* this species may at once be recognized by the large size of the mouth and the union of the two posterior dorsals into one fin, each portion of which, as well as the first dorsal and the two portions of the anal, is highest near the center of its length.

Microgadus californicus, Gill; *Morrhua proxima*, Girard, Tomcod—This little fish is abundant throughout the year, and I am assured that when it is properly cooked no fish of the coast surpasses it in flavor. It may be at once known from every other fish by the three separate triangular dorsal fins, the first highest and all highest anteriorly, the small mouth, and the short barbel below the chin. In length it seldom exceeds eight or nine inches. It is common in the Bay of San Francisco.

SUBORDER HETEROSOMATA—FLAT-FISHES.

No tribe of fishes is probably so well known to that large class of naturalists whose love of nature takes a practical turn, who like best those creatures which taste best when boiled or fried, as the flounders, flat-fishes, or *Pleuronectidæ*. Apart from their attractiveness to the sense of taste, they have one peculiarity which challenges the attention of the most uninterested observer of this world's living wonders—they have both their eyes placed on the same side of the head. If a little more attention be paid to this obvious feature, it will be found to be even a greater peculiarity than was at first supposed. The flounders are not the only fishes which have their eyes on the same side of the body; the skates, rays, torpedoes, and their relations are in this respect similar. Where then, lies the great difference between these two classes, for no one would confound the two, even at the first glance? Simply in this, that the skate and ray tribe are flattened downwards, the side which is uppermost is the proper upper side, and the eyes are placed in their usual position with regard to the other parts of the head; whereas, in the flat-fishes the body is flattened out sideways, the fish swims on one of its sides, instead of on the proper under-surface; and the eye which of right belongs to the side which is beneath, has twisted round out of its place, and is situated on the same side with the other, unsymmetrically with the other parts of the head. Of course this is not the only difference between the skates and the flounders. There are far more important anatomical differences, but it is one of the most obvious outward distinctions between two tribes which, though widely separated in other respects, resemble each other in having the eye so placed as to look upwards, in their thin flat bodies, colored upon the upper side only, or principally, and in their habit of residing at the bottom of the sea; their uncolored surface resting on the bottom. Again, the flat-fishes are not the only fishes which have a very wide body, flattened laterally; the sunfish is also very deep from dorsal to anal; and some of the mackerel tribe are even more excessively compressed; but these and all other laterally compressed fishes, except the flat-fishes, swim in the usual manner, dorsal fin uppermost, and the eyes are in the usual position—one on each side.

It will be readily understood that the two eyes cannot be brought round to one cheek without great distortion of the bones of the skull; many of the bones on the colored side are cramped in their development, squeezed into a narrow space, out of the way of the encroaching eye; while some of the bones of the blind side are correspondingly enlarged, filling up, by their lateral extension, the place where, so to speak, the eye ought to be. Now, a distortion of this importance, if it were not of universal occurrence in the whole tribe, would be considered a monstrosity; and it became an interesting question to ascertain at what point in the life history of these fishes the distortion commenced. Surely so very important and radical a modification of the skull and bones of the head must commence at the very first beginning of the formation of the fish, before it is hatched from the ovum. But it has lately been conclusively proved that this is not the case. Professor Alexander Agassiz has watched the development of young flounders, and has proved that when first hatched, they resemble other fishes in the position of the eyes and the symmetrical form of the head; and that the distortion is the result of habit, which habit again increases the distortion, precisely as claimed by the advocates of what is usually called "evolution." That is to say, the young fishes seek the bottom of the water, yet strive to use the lower eye. By the continued effort to use this, the soft structure of the head is affected, and an oblique upward view is gained. This renders the fish less fitted than before for locomotion in the usual manner, and more adapted for keeping at the bottom, which it accordingly does, with the result that the eye becomes more and more twisted till it at last has passed clear over the dorsal ridge of the animal, and makes its appearance on the same side with the other eye. This side is, in some species, the right, while in others it is the left side. All this takes place while the creature is young, before the bones are hardened. It would appear that in some cases, the eye literally passes through the head.

But it must be remembered that the bones of fishes are, as a whole, much softer than those of reptiles, birds, or mammals, and therefore much more capable of yielding to impressions from the outside without the destruction of the life of the organism.

Thirteen species of these fishes are now known to occur on this part of the coast, and all of them are brought to our markets more or less frequently. All these species belong to the family *Pleuronectidæ*, or flounders, from which the *Soleidæ*, or soles, are distinguished by the absence or rudimentary condition of the pectoral fins. Although no real sole occurs here, all the species except the two known as "halibut," that called "turbot," and another which the dealers know as "bastard turbot," are sold in the market under the name of "sole."

Hippoglossus vulgaris, Halibut—The rarest of these species is a true halibut, or *Hippoglossus*, which Professor Goode, the well known ichthyologist, believes to be identical with the Atlantic species *Hippoglossus vulgaris*. *Hippoglossus vulgaris*, an Arctic species, extends therefore along the coasts of Europe, eastern North America, and Northwest America, reaching on this coast the latitude of San Francisco, which is probably its most southern point. It is occasionally taken at the Farallone Islands, but as yet I have only seen a single specimen brought from thence. To the northward, about Vancouver Island, it becomes abundant, as it is also in Alaska. This fish is greatly

esteemed as an article of food, and, on account of its rarity, it has, until lately, commanded a high price. The individual above mentioned was retailed at fifty cents per pound.

A schooner has recently been fitted up expressly for the purpose of bringing fresh halibut, packed in ice, from Puget Sound, or its vicinity, to San Francisco. The trip down occupies about four days, and the fish, entire, with the exception of the viscera, arrive in perfectly good condition. Two trips have been taken this year, and halibut has been retailed at from ten to fifteen cents per pound. The three largest halibut taken weighed respectively 180, 190, and 220 pounds, and their weight with the viscera would probably be about one-fifth more. The individual weighing 190 pounds measured 7' 1" in total length, and had three or four rows of teeth in the front of each jaw.

Psettichthys melanostictus, Girard, Sole.—As most of the fishermen and fishmongers of San Francisco and its neighborhood are Europeans, principally Italians and other Mediterranean peoples, with a sprinkling of English and New Englanders, they have given to such fishes as they have thought worthy of a vernacular title names which properly belong to species found in the Mediterranean and Atlantic, and frequently, but distantly, related to their Pacific namesakes. In pursuance of this rule, the name of "sole" is applied to several species brought to the markets of San Francisco, and among these the most common is the one named above. It does not appear, so far as I have been able to ascertain, to be caught in any great quantity within the Bay of San Francisco, but is usually taken outside the heads and at the Farallone Islands. The greater portion of those sold in the markets are about ten inches in length, but some attain a length of eighteen inches or even more. This species may be readily distinguished from all the other flat-fishes of our coast by the form of the dorsal fin, the first rays of which, situated on the top of the head, are higher than those immediately succeeding them, and by the dark gray color, produced by black spots, just large enough to be recognized as such by the naked eye, upon a ground of a lighter tint. These black spots are not conspicuous in individuals just taken from the water, which are of a more uniform and far lighter color, but become so after a few hours exposure to the air. The interorbital space varies in width, apparently increasing with age, though not always in proportion to the size of the individual. The number of rays in the dorsal and anal fins is, as is not unusual among long-finned fishes, subject to considerable variation, the number of dorsal rays ranging from seventy-eight to eighty-eight and that of the anal rays from fifty-eight to sixty-two. The proportions of the body also vary considerably, some being much narrower than others, but the species is always more elongated than *Hippoglossoides jordani*, with which it is often confounded. The scales are not smooth, as described by Girard, but ciliate upon their free margins; and there is also running along, close to and parallel with the dorsal outline of the anterior part of the body, a second or "accessory" lateral line, a feature which is repeated in several of the small-mouthed flounders. In the stomach of a specimen seven and a quarter inches long were the half-digested remains of two anchovies (*Engraulis ringens*).

Hippoglossoides jordani (nov. sp.), Sole—This species is tolerably common in the markets of San Francisco, but appears to have hith-

erto escaped description, probably on account of its considerable external resemblance to *Psettichthys melanostictus*, Girard, from which, however, it may be readily distinguished by the much larger eyes; the form of the dorsal fin, which increases toward the center instead of commencing with rays higher than those immediately succeeding them (as is the case in the latter species); by the narrower interorbital space; and, still more readily, by the color, which is more uniform and lighter, the black points upon the scales, which are conspicuous to the naked eye in *Psettichthys melanostictus*, not being evident unless viewed with a lens. In large specimens the head has a reddish tinge. The largest I have yet seen measured eighteen inches in length. In common with *Psettichthys melanostictus* this species bears in the markets the name of "sole," and many of the fishmongers, who readily distinguish from each other most of the species of flat-fishes, do not appear to discriminate between these. So far as I have been able to learn, it is taken outside the bay in the same localities with *Psettichthys melanostictus*. In form of body, size, structure of the mouth, scales, and lateral line, this species resembles the species previously mentioned; and the distinctions between them would, in fact, be considered only of specific value were it not for the presence in *Psettichthys melanostictus* of an accessory lateral line along the dorsal outline, a character which this species does not possess. A technical description of this fish has been published in the Proceedings United States National Museum, September, 1879, p. 73, and I have taken the liberty to name it after the distinguished ichthyologist, Professor D. S. Jordan, who has done more than any other American naturalist to increase our knowledge of the fresh water fishes of the United States, and who is at present engaged in preparing an Ichthyology of the United States, which will include the fishes of the Pacific Coast.

Those dealers who distinguish this fish from *Psettichthys melanostictus* do not appear to rate its value as an article of food equal to that of the latter; but the two kinds lie together on the stalls, and are sold for the same price. The scales are ciliate or rough upon their hinder margins, but less so than in the previous species.

Paralichthys maculosus, Girard, Monterey Halibut—This species attains a large size, larger than that of any other of our flat-fishes except the true halibut, *Hippoglossus*. Individuals of from 30 to 40 pounds weight are comparatively common. The two largest I have yet seen weighed respectively 43 and 58 pounds, and I am told that it reaches from 60 to 70 pounds. The example weighing 58 pounds measured nearly five feet in total length. Small individuals of this species, having the eyes and color on the right side, were described by Girard as *Paralichthys maculosus*. Subsequently Dr. Ayres described, under the name of *Hippoglossus californicus*, a form which proves to be really only the adult of Girard's species. As his examples were sinistral in their coloration, it was until very lately believed that these two names represented two distinct species, but it has now been proved that they are one species, which is sometimes dextral, sometimes sinistral. The row of bluish spots along the dorsal and abdominal outlines, which doubtless suggested the name *maculosus*, is present in the adult, but is less distinct; and the caudal fin, said to be convex in *maculosus*, and concave in *californicus*, proves to have a sinuous outline, the central and exterior rays produced beyond those

lying between them. The Monterey, or "bastard" halibut, as it is sometimes called, may be known from our other *Pleuronectidæ* by its short head; elongate, regularly ovate form; small scales, with a row of long, narrow accessory scales along their free margin; and by the bold, abrupt arch made by the lateral line above the pectoral fins. In numbers it is not common compared with the two previously-mentioned species, but makes up in bulk during the months it is in season. Throughout the winter and early spring it is scarce, but large individuals become tolerably abundant in April, and throughout the summer the young are sometimes sold as "turbot." Those brought to market usually come from Monterey or its vicinity, but it also occurs northwards, at least as far as Tomales Bay, and southwards to San Diego, whence Girard's type was procured.

Citharichthys sordidus, Günther; *Psettichthys sordidus*, Girard, Left-handed Flounder—This species is brought in considerable numbers to the markets of San Francisco, and can be readily distinguished from every other kind occurring on this part of the coast by the combined characters of eyes and color on the left side, lateral line almost perfectly straight, bony, ridge-like interocular space, and insertion of the ventral fin of the colored side upon the ridge of the abdomen, instead of on the same level with that of the blind side. As is the case with many other species, the number of rays in the dorsal and anal fins is not constant. In color this fish is of a dirty yellow or yellowish-brown, with each scale margined with blackish and the fins speckled with the same. The scales are smooth and very flexible. As the dealers do not appear to have given it any title, I have here named it by its most obvious characteristic, namely, the presence of the eyes and color on the left side; not that it is the only species possessing this character, but because, so far as I have been able to observe, it is constant in possessing it, while the Monterey halibut and the species usually known here as the "flounder" (*Platichthys stellatus*) are sometimes dextral, but in other cases sinistral. The left-handed flounder does not usually attain the dimensions of any of the previously described species, the usual length of those brought to market being only from ten to twelve inches. It is not taken within the Bay of San Francisco. How far its range extends either northward or southward I do not know, but in the latter direction it certainly reaches to San Diego, as a dried specimen, sent to the Smithsonian Institution by Dr. J. G. Cooper, furnished Professor Gill with the type of his new genus, *Metoponops*.

Glyptocephalus zachirus (Lockington, Proceedings United States National Museum, September, 1879, p. 83)—This hitherto unnoticed species of flounder owes its specific name to the great length of the pectoral fin of the right or colored side of the body. This fin is much longer than the head and about equal to one-fourth of the total length of the fish, but it can scarcely be of much value to locomotion, as only one or two rays are thus excessively lengthened, the others falling off rapidly on each side. This character alone is sufficient to distinguish it, not only from its nearest relation on this coast, *Glyptocephalus pacificus*, hereafter mentioned, but from every other species of flounder, and it is further characterized by the blunt, rounded form of the front part of the head, a character not shared to anything like an equal extent by any other of our flat-fishes. It also differs from its congener in the presence of a spine in front of the anal fin. The color, like that of many other of our fishes, is rather difficult to

describe. It is a more or less dark gray ash, formed by minute black points upon a lighter yet colored ground. On the blind side there are also numerous black points, but they beset a white ground, producing a light gray tint.

The two *Glyptocephali* of this coast may thus be distinguished from the other flounders by the coloration of their blind side, as well as by their exceedingly elongate form. As this fish has no name in our vernacular, it may be as well to call it the "long-finned flounder." The long-finned flounder is not taken in our bay, and I have not yet been able to ascertain the locality from which it is brought. I first noticed this species about March 21st, and from that date to July it has been almost regularly present, but always in small quantity. I have not observed it in August or September. The largest that I have yet seen measured $14\frac{5}{8}$ " in length and $4\frac{1}{4}$ " in depth, the length of the head being $2\frac{5}{8}$ " and that of the pectoral fin $3\frac{1}{16}$ ". The dorsal of this individual contained 98 rays and anal 81 rays; but some individuals have as many as 186 dorsal and 89 anal rays. I have experimented on the edibility of this fish, and pronounce it one of the best, if not the best, of our flat-fishes, an opinion in which I am borne out by others who have tried it.

Glyptocephalus pacificus, Lockington—On visiting the market, on the 13th of March, I found, among the small flat-fishes exposed for sale, two small specimens, which, from their excessively elongated form and the considerable thickness of the body, seemed new to me. These fishes were between eight and nine inches long, their width was but a little more than a fourth of their length (a most remarkable proportion for a flounder), and the short head was less than the greatest depth; the mouth was very small, the lateral line quite straight, the scales minute and quite smooth, and the color a dark, blackish gray, with the tips of the fins darker, approaching black. The dorsal fin, as might be expected from the proportions of the fish, was exceedingly elongated, and contained many more rays than that of any other of our flat-fishes, the two specimens having respectively 102 and 104 rays. The anal fin was correspondingly elongated, and contained 84 rays in one and 87 in the other. The teeth, twelve in number in the lower, and nine or ten in the upper jaw, were broad and flat, with a cutting edge, like the incisors of a mammal, and formed a close row along the jaws on the blind side and in front, while there were none upon the colored side. It agrees in the length of the dorsal, elongate body, smooth scales, and straight lateral line, with the genus *Glyptocephalus*, and has been described as *Glyptocephalus pacificus* in the Proceedings of the National Museum, September, 1879, p. 86.

This species cannot certainly be brought to market during the winter, as, though I was a regular visitor of the markets from September to March, I never met with it. From the date of its first occurrence until September this fish has usually been in the market, and during the summer has been comparatively abundant. The largest I have seen measured nearly twelve inches in length, and this is probably almost the limit of the growth of the species. In flavor it is excellent, but scarcely equal to its congener *Glyptocephalus zachirus*. This species and the preceding are taken in seines, in tolerably deep water, four or five miles from Point Reyes. The fishery is only two years old.

Platichthys stellatus, *Platichthys rugosus*, Girard—This species, com-

monly called flounder, is by far the most abundant of the kinds brought to our market, and attains a larger size than any other, except the bastard halibut (*Paralichthys maculosus*) and the *Hippoglossus*. The eyes and color are sometimes upon the left side, at others upon the right; a circumstance that has rather bothered naturalists, while it has served as a basis for fanciful theories among the fishermen. It may be readily distinguished by its short broad form, the width exceeding somewhat the half of the length (excluding the caudal fin); by the presence, instead of scales, of scattered, rough, stellated tubercles; and by the black bands upon dorsal, anal, and caudal fins, four upon the first, three upon the second, and three upon the last, all of them running in the direction of the rays. It is of wide distribution, occurring along the coast of Kamtschatka, and from thence extending by Behring's Straits, Alaska, and British Columbia southward to San Francisco. How far it may occur to the south of the latter point does not appear to be known with certainty, but as it is evidently a northern form, it is not unlikely that its southern limit will be found to be near Monterey, at which point there is a mingling of northern and southern forms, resulting in an extremely rich local marine fauna; rich not only in species of fishes, but in *mollusca*, *echinoderms*, and *coelenterates*. The flounder occurs within the Bay of San Francisco, and is brought to market not only from thence, but from various points outside of the heads; some are even sent from Humboldt Bay, but it is said that these are far coarser than those obtained elsewhere, with comparatively less meat, and fetch a much lower price in the market.

Those taken here attain a weight of eight, ten, or even twelve pounds, but those sent from Humboldt Bay are much heavier. In this species the number of the dorsal and anal fin rays does not appear to be subject to so much variation as in many other flat-fishes. Many of the fishermen believe that they know the reason why this fish is sometimes colored on the right, and sometimes on the left side. It is, they are confident, caused by the moon, and depends upon the side illumined by that orb at the time of fecundation. A far more intelligent theory, but one which yet lacks proof, is held by the fishermen and dealers, to the effect that those colored on the left side are females, while those colored upon the right side are males. The same theory is held in the case of the Monterey halibut. The old Russian naturalist, Pallas, first described this species, which was described by Girard in 1865. The identity of Girard's form with that of Pallas was noted by Gill (Proceedings of the Philadelphia Academy of Natural Science, 1862, p. 281), and by Günther (Catalogue of Fishes, British Museum, vol. IV, p. 443).

Pleuronichthys guttulatus, Girard, Turbot—This fish, the "turbot" of our markets, is one of the commonest of our flounders, but is usually of small size. Occasionally, however, individuals are taken weighing as much as five pounds, and measuring eighteen inches in length. The color alone is sufficient to distinguish it from all the other species. On the colored side it is, when quite fresh, of a dark olive green, sometimes blotched with irregular whitish spots. By exposure to the air the color deepens to nearly black. The underside is opaque white, like white lead, but along the margin of the head, from some distance above the eye, and continuing to the anus is a border of bright gamboge yellow, broadest and brightest upon the snout and lower jaw. Sometimes the whole of the under surface

is yellow. It is a very broad species, in this respect rivaling and even exceeding *Platichthys stellatus* (the "flounder"), the width being nearly or quite half of the breadth. Another characteristic may be found in the teeth, which, instead of being a single row, form several rows, a character shared only by one other of our flat-fishes, *Pleuronichthys cœnosus*, which differs widely in the color, as well as in having the dorsal fin continued downwards along the blind side of the head, and in the very much larger eyes. The number of rays in the dorsal varies from 66 to 72, and those in the anal from 47 to 54, a range which, had the two extremes fallen into the hands of two different naturalists, might well have led them to make two species. Nor has this fish, short as has been its literary history, escaped from a synonym. It was first described by Girard (Pacific Railroad Report, vol. 10, p. 152), who attributed to it 67 dorsal and 47 anal rays, and gave its color as "greyish, or lead, sprinkled all over with black dots and whitish spots." In 1862 Dr. A. Günther re-described it, under the name of *Parophrys ayresii* (Catalogue of Fishes, British Museum, vol. IV, p. 456), yet admitted *Pleuronectes guttulatus* as a species. The insufficient description of Girard was doubtless the cause of this error. Girard's specimen came from Tomales, and I am informed that it is in the neighborhood of Tomales Bay that most of the turbot brought to market are procured. This fish is much esteemed, and always commands a high price.

Pleuronichthys cœnosus, Girard—This is a rare species, and evidently inhabits deep water, since the eyes of those I have seen protrude from their sockets, through the sudden change from pressure at the depths where they reside to that of the surface. There are three characters about it which render it impossible to confound it with any other species: the very large eyes, which equal or exceed in diameter one-third of the length of the head, from the tip of the snout to that of the gill covers; the very short, snub snout, scarcely projecting beyond the protuding eye, and the singular course of the dorsal fin, the front part of which, instead of ending upon the dorsal ridge somewhere over the eyes, as in other species, curves over at that point to the blind side of the fish, and continues downwards along that side till it reaches a point level with, and not far from, the end of the maxillary or upper jaw. About eight rays are thus twisted over to the left side. The color also, a uniform warm reddish-brown, is very distinctive. The teeth, like those of the last species, (*Pleuronectes guttulatus*) are in several rows, and in the form of the body and fins the two kinds are also much alike.

Girard's original description was drawn from a single specimen, the only one he had seen. It is taken near the Farallones. The left or eyeless side is not always colorless, but has frequently several dark brown spots or blotches. The dorsal fin is occasionally carried further down on the blind side than is mentioned above, while in other cases only four rays are twisted over. During the winter this species did not occur in the market, but on the 26th of February one of the first of the season was brought to me, and since then it has gradually become more abundant until May, during which month it was as plentiful as *Lepidopsetta bilineata*, itself a rather rare species, also brought from the Farallones.

Parophrys vetulus, Girard, Sole; Diamond Flounder—This is another of the common flat-fishes of our markets, and is grouped

with several others under the name of sole. It may be recognized by its elongate, narrow head, with the upper eye placed upon the dorsal ridge, so as to look dorsally as well as laterally, by its elongate, rhombic form, the outlines of the posterior portion of the body being nearly straight, and by the development of the teeth upon the blind side only, where they form a single row. In color it is usually of a uniform reddish ash, but some of the younger individuals are irregularly spotted with darker blotches. On the blind side it is creamy-white. The number of rays in the dorsal and anal fins varies from 74 to 86 and from about 54 to 68 respectively, a variation which has probably been the cause of the description of the nominal species, *digrammus* and *hubbardi*, by Günther and Gill. Those brought to market are from eight to fifteen inches long, and occasionally a little larger, but the species does not appear to attain the weight of *Pset-tichthys melanostictus* or *Hippoglossoides jordani*, as it is much more slender in form. It is usually taken outside the bay. As a food fish, according to my judgment, as well as that of those dealers who distinguish it, it is inferior to the two species just mentioned.

Lepidopsetta bilineata; *Platessa bilineata*, Ayres, Mottled Flounder—The first description of this fish will be found in the Proceedings of the California Academy of Sciences, vol. 1, p. —. It is one of the numerous forms described by Dr. Ayres, and has always been one of the rarest and least known of our fishes, very little having been added to our knowledge of it since Ayres wrote. It may be readily known from every other kind found here by the following characters: Many of the scales upon the body are ctenoid; that is, beset upon their hinder edges with spinules; those on the cheeks are tubercular or roughened with bluntish points upon a large part of their surface; the form is regularly oval, the width of the body almost equal to half of the total length, and the color a quite light yellow with irregular white spots.

As in so many other of the more nearly related flat-fishes, the teeth, which are in a single row, are not equally developed on the two sides of the jaws, but are principally upon the blind side. The eyes are large, forming $\frac{2}{3}$ of the length of the head. This species is only occasionally brought to the markets, where, with several species previously mentioned, it bears the name of "sole." Those brought are usually of tolerably large size, from fourteen to fifteen inches long, and are caught at or near the Farallone Islands, though probably not in such deep water as *Pleuronichthys cerosus*, since the eyes do not protrude, as is usually the case with the eyes of fishes suddenly brought up from deep water. On account of the spots upon its surface, I have given it the name of "mottled sole," or rather, mottled flounder. As a food fish it is excellent, yet is not considered equal to *Psetichthys melanostictus*. The lateral line, or row of pores which runs along the body from the head to the tip of the caudal fin, makes a bold, semi-circular arch over the pectoral fin; and there is, as in the three preceding species and the one following, an accessory line of pores running from some distance along the dorsal margin. This accessory lateral line is subject to curious modifications in its length and in the form of its anterior branches. The whitish blotches upon the colored side often form a series along the dorsal and abdominal margins.

Lepidopsetta umbrosa; *Platichthys umbrosus*, Girard—This species is most nearly related to the mottled sole from the Farrallone Islands

(*Lepidopsetta bilineata*), sharing with it the characters of rough scales and lateral line considerably arched above the pectoral fin. From that species it may be very readily distinguished by its color, which is of a dark uniform slaty brown, and from all other species by the combination of the two characters first mentioned, together with its regularly ovate form and small, quite laterally-placed eyes. It does not appear to be very common, as there are rarely above two or three specimens among a miscellaneous heap of flat-fishes, and the usual size does not exceed ten or eleven inches in length. From its small size and comparatively unfrequent occurrence it cannot be considered as of great value from an economic point of view. It is sold along with other species as "sole," and fetches the same price. The extent and boldness of the arch of the lateral line varies greatly.

SUBORDER ISOSPONDYLI.

This suborder is the *Physostomi* or *Malacopteri* of Cuvier and the older naturalists, minus the *Nematognathi* or *Silurians*; the *Haplomi* (pike-toothed minnows, etc.), and the *Eventognathi* or carp-like fishes. The fins are without spines (except one or two in dorsal or anal), the ventral has no spine, the scales are cycloid, the head is naked, and an adipose fin is present behind the true dorsal in some, while others have a serrated abdomen. The families, genera, and species included in this suborder are more numerous than those in any other, the *Acanthopteri* alone excepted, and among these families are two which, in their value to man, probably exceed any other, namely, the *Salmonidæ* and the *Clupeidæ*.

Of the remaining families one only, the *Synodontidæ*, sends a member to our markets in the person of *Synodon lucioceph*, Ayres, which is not improbably identical with *Synodon* (Saurus) *fatcus*, Linn, a species known to occur upon the Pacific coast of Panama. In September and October, 1878, numerous specimens of this species occurred in the market, most of them eight to ten inches in length, but one individual reached seventeen and three-fourths inches. It is occasionally taken in the bay.

SALMONIDÆ.

The *Salmonidæ* are by far the most important group of fishes on this coast. The species of greatest value belong to the genera *Oncorhynchus*, *Salar*, and *Salvelinus*. These will not be treated of here. The single species of *Coregonus* that is known to inhabit the fresh waters of the State is not brought to market, so the only salmonoids remaining for our notice are the small marine fishes forming the group of the *Microstomatidæ*. All the *Salmonidæ* have an adipose fin; the maxillaries enter into the formation of the lateral part of the upper jaw: the belly is rounded and without serratures, and the air bladder is large and simple.

Hypomesus olidus—This delicate fish is, at first glance, similar to the following species, but the mouth is very small, the end of the maxillary bone reaching only level with the front of the eye, while in *Osmerus thaleichthys* it reaches to the back of the orbit. The head also is somewhat smaller. But this fish, when fresh, can be most readily distinguished by the transparency of its flesh, which, of course disappears entirely in preserved specimens. The silvery band along the sides, which is found in all the four species, and is probably the cause of their being grouped together as smelts, is particularly bright in this fish. This species has been tolerably abundant in our markets from October to August. In size it is usually somewhat larger than *Osmerus elongatus* or *Osmerus thaleichthys*, attaining a length of about eight inches.

Osmerus thaleichthys is really the nearest representative of the smelt of Europe, having the peculiar, pleasant smell that suggests the name in that species, which is also a kind of *Osmerus*. It may readily be distinguished from the two species of *Atherinidæ*, *Chirostoma californiensis*, and *Atherinops affinis* by the want of spinous rays on the back, by the adipose fin, by the absence of the bright green tint, which is replaced on the back by a dull, greenish olive, on which a diamond

pattern is traced by rows of minute dark dots that fringe each scale, and by its smaller size. From *Hypomesus olidus* it may easily be known by the comparatively large size of the mouth and less transparent appearance. It is usually from five to five and a half inches in length. Its form is stouter than that of *Hypomesus olidus*, the flesh is soft in texture, and the pectoral fins reach very nearly to the origin of the ventrals. This form, like the last, has been present in the markets throughout the year in variable quantity.

Osmerus elongatus, Ayres—Among the fishes described in the early days of the California Academy of Sciences, by Dr. W. O. Ayres, was a species belonging to the smelt or *Osmeroid* group of the salmon family. A short description, unfortunately too short and incomplete for identification, was published in vol. 1, p. 17, of our Proceedings. Girard, in the Pacific Railroad Report, vol. 10, states his belief that Ayres' species is identical with the small-mouthed smelt of this coast. (*Argentina pretiosa*, Girard; *Hypomesus olidus*, Pallas, Gill). Examination of the small salmonoids brought to this market proves, however, that there are three species. One is Girard's small-mouthed species; another Ayres' *Osmerus thaleichthys*, described and figured in vol. 2, p. 62 of Proceedings of the Academy, while the third is almost certainly the *Osmerus elongatus* of the latter authority.

It is not easy for the unpracticed eye to tell these species apart, yet the differences are obvious when once recognized and are of a constant character. In this species the form of the body is more slender and elongated than in either of the other smelts, the dorsal fin is constantly farther back on the body, the lower jaw is long, resembling in this respect Ayres' other species, but differing from it in its straightness, that of *Osmerus thaleichthys* being curved upwards, and the profile of the top of the head differs from that of the last named form in the greater elongation and more pointed form of the snout. The dentition is strong, teeth being present on jaws, tongue, and palatines, the largest upon the front of the tongue. The dealers are able to distinguish the three species apart, trusting as much to the difference in the texture of the flesh, as evident to the touch, as to the variation in appearance. In alcoholic specimens this distinction is of course lost, and the species are harder to distinguish than when fresh. This may account for the union of two species under one name by Girard, though I believe it more probable that he never saw Ayres' species.

Among the heaps of small fishes sold for fry may usually be found all the three species of salmonoid smelts, the anchovy (*Engraulis ringens*), and small individuals of the smaller species of mullet-like smelt (*Atherinops affinis*).

CLUPEIDÆ.

This family as originally constituted comprised a large number of soft-finned fishes without an adipose dorsal, with the lateral margin of the upper jaw formed by the maxillaries, which are usually in three pieces, and with rather large scales. The sections of this large family have been lately raised to the rank of families, and are distinguished by very obvious features; thus the true *Clupeidæ* or herrings have the abdomen compressed to a sharp edge, which is set with a row of plates forming serrations; the lateral line is absent, and the teeth either very small or altogether wanting; the *Engraulidæ* or anchovies have the abdomen rounded, the upper jaw much longer than the lower, which is toothless, the mouth large, and the sides with a bright silvery band; while the *Albulidæ* or lady-fishes have a rounded abdomen, the upper jaw rather the longer, both jaws set with bands of villiform (velvet-like) teeth, and the roof and floor of the mouth covered with pavement-like patches of coarse granular teeth. These *Clupeidæ* are represented upon our coast by at least four species, three of which are of sufficient importance to rank as food fishes.

Albulavulpes, the sole member of the *Albulidæ*, and in many respects a very singular species,

is a widely distributed fish, occurring in both the great oceans. Single individuals occasionally find their way to this market, probably from Monterey Bay.

Clupea mirabilis, Girard, Herring—This species may be known from the succeeding one by the projecting lower jaw, deeper and thinner body, and by the absence of conspicuous striations upon the gill-covers. It comes into the market in September and continues in season until late in the spring. North of Puget Sound it is said to occur throughout the year, and shoals visit various points upon the coast of California during the rainy season. The business of curing the fish is not extensive, and the dried fish is said to be inferior to that of the Atlantic herring, though it is probable that the inferiority is mainly in the method of preparation.

Clupea sagax, Jenyns, Sardine—This is a thicker, less deep, and somewhat longer fish than the last, the jaws are equal in length or nearly so, and present no trace of teeth, and the operculum has conspicuous radiating striae, descending towards the sub-operculum. The form of the ridges on the upper surface of the head is also very different. The colors are exceedingly intense in the fresh fish, bluish-purple predominating, and there is a row of dark spots along each side. It is in season during the summer and winter, and is taken in the Bay of San Francisco.

Engraulis ringens, Jenyns, Anchovy—A species exceedingly common in the bay, and extending along a great part of the Pacific Coast of America. By the large mouth, with the upper jaw projecting beyond the lower, the present genus may be at once known from *Clupea*, and the present species is the only one of the genus which I have yet recognized in our markets. Although so near to the highly esteemed anchovy of Europe this fish does not appear to be in great favor, judging from the large number which are wasted by the fishermen, but it is at least useful as forming a large proportion of the food of the flat-fishes; if I may judge from the fact that I have found it in the stomachs of three species of that tribe. As the *Pleuronectidae* live on the bottom, I presume that the anchovy is also an inhabitant of the lower strata of the water. Abundant though this species is, it is not cured or preserved in any way, but I am told that an abortive effort in this direction was once made.

SUBORDER EVENTOGNATHI.

The *Eventognathi* of Professor Gill, or *Cyprinida* of the older authors, are chiefly distinguished by the total absence of teeth upon jaw, vomer, or palatines, the only teeth they possess being those upon the pharyngeal bones at the entrance of the œsophagus. They are without a spinous dorsal or anal spine. The scales are cycloid, and in many cases of large size; there is no adipose dorsal fin, and the surface of the head is without scales. They are inhabitants of fresh water, and occur in both the eastern and western hemispheres. The family *Catostomida*, or suckers, is almost peculiar to America, and several of its species occur in California, although but one is brought in sufficient quantity to the markets of this city to be worthy of mention as a food fish.

Species of the true *Cyprinida* abound in the waters of this State, and several are brought to market with tolerable frequency; others more rarely. None of them, however, are very highly prized for food.

The *Catostomida* are distinguished by a mouth opening more or less downwards and furnished with conspicuous fleshy lips, the intermaxillaries, and by lower pharyngeal teeth in a single series—numerous, closely-set, comb-like, across the bone. There are no barbels, and the air bladder is large, divided into two or three portions by transverse constrictions.

The *Cyprinida* are without the thick, fleshy lips which characterize the last family: the pharyngeal teeth are few in number, rarely more than seven on each side, but often in two or three series. Barbels are often developed upon the lower jaw, and the air bladder is usually divided into an anterior and a posterior lobe.

Gila grandis, Ayres, Girard, Pike—This, as Ayres enthusiastically remarks, "is by far the finest fish of its family known to inhabit the waters of this continent."

It did not occur in the markets of this city in October, November, or December; but from January 6th, when I first observed an individual 2' 9½" long, until the end of May, has been tolerably abundant. The largest measured by Ayres was three feet long, but he reports examples weighing thirty pounds, and I have been told that it sometimes approaches four feet in length.

The name "pike," under which it is now generally sold, is as great a misnomer as that of "salmon trout," which Ayres gives as a dealer's name. The absurdity of both names will be evident to any one who remembers that both pike and salmon have a mouth liberally supplied with teeth, while the *Cyprinidae* are all literally toothless as regards the mouth, their only teeth being on the pharyngeal bones in the throat. But the shape of the head, depressed in front, recalls that of the pike. It is a handsome fish, dark greenish gold on the top of the head, and the same, but lighter, on the back, and still lighter behind the dorsal fin, the color fading on the sides to silvery with golden reflections, and on the abdomen to plain silvery.

As the largest species found east of the Mississippi, *Semotilus bullaris*, rarely attains, according to Professor Jordan, "a weight of three or four pounds, and a length of nearly eighteen inches," it is evident that the present species is a giant among the minnows.

Pogonichthys inaequilobus, Girard, Split-tail—This species has been brought to market in tolerable abundance during the spring in company with *Catostomus occidentalis*, *Orthodon microlepidotus*, and *Gila grandis*. It may at once be known by the great length of the upper lobe of the tail fin, which projects considerably beyond the lower and has suggested the name of "split-tail," by which it is known in the markets.

Orthodon microlepidotus, Girard, Fan-tail—This is another of the more abundant *Cyprinoids* of our markets, brought in company with the three previously mentioned species. It attains a length of thirteen or fourteen inches. In color it is metallic greenish gold above, the top of the head dark olive green, with iridescent suborbitals, sides bright metallic silvery, lower surface silvery white. The surface of the head is crossed by a complex system of rows of pores, the caudal fin is large and fan-shaped, and the scales are remarkable from their small size.

Siboma crassicauda, Girard, which may fitly be named the thick-tail, is of occasional occurrence, as is also *Lavinia exilicauda*.

Catostomus occidentalis, Ayres, Western Sucker—This species is tolerably abundant in our markets at certain seasons, the supply being obtained from the Sacramento or its tributaries. Jordan (Bulletin United States Natural Museum, vol. 12, p. 172) mentions its occurrence in Green River, Wyoming, and says of its habitat "streams west of the Rocky Mountains, probably generally distributed." It is the only *Catostomoid* I have yet seen in the markets, and I did not observe its occurrence there until February, since which time the supply has been tolerably regular. The usual size of those brought here is from twelve to sixteen inches long. The scales are of variable size, increasing in size from the head backwards, so that the largest are upon the caudal peduncle and the smallest on the back, just behind the head. The scaleless head has a well-

developed system of pores. In color it is not a very dark olivaceous above, with bluish silvery reflections, becoming lighter posteriorly. Each scale of the dark colored portion is darkest around its edges, rendering the pattern of the scales very distinct. The color fades into silvery on the sides, and silvery white below, with metallic reflections, most evident on the base of the caudal.

SUBCLASS GANOIDEI.

The fishes constituting this subclass vary immensely in structure, so much so that almost every genus constitutes a family, and every family is equivalent to an order; so much so that our leading systematists are divided in their opinions as to the limits of the subclass, and have weighted the world with arguments to prove that the curious mud-fishes (*Lepidosiren* and *Protopterus*) of South America and of the Gambia belong to it, and vice versa; and so much so that some have even suggested the dismembering of the subclass, considering the differences in structure among its members to outweigh the resemblances. All agree, however, in the importance and great extent of the structural peculiarities of each group; although the characters they possess in common are two only, the arterial bulb (of the heart) with several rows of valves, and optic nerves which do not simply cross, but form a chiasma. In common with the sharks and rays, they have heterocercal tail, that is a tail with the upper lobe, containing a prolongation of the vertebral column, longer than the lower, which is developed below it like a second anal fin: the air bladder differs in structure in the various groups, and the bony or ganoid enamelled plates which characterize some of the more typical form are wanting in others.

The only ganoid fishes found on this coast belong to the *chondrostei* or cartilaginous ganoids, or, which is the same thing, to the family *Acipenseridae* or sturgeons. The skeleton is cartilaginous, five longitudinal rows of bony shields run along the elongate, subcylindrical body; the toothless mouth is a transverse slit on the under side of the head, in the same position as that of the shark; in front of the mouth are four barbels; and the dorsal and anal fins are set far back. There are no gill rays or branchiostegals: a large air-bladder, and the intestine has a spiral valve. The species are numerous; three or four occur on this coast, but only one is brought to our markets in quantity.

Acipenser brachyrhynchus, Ayres, Sturgeon—This is the only species of sturgeon which is brought to market in abundance, as the fishermen have a prejudice against the long-nosed or green sturgeon, *Acipenser acutirostris*, Ayres, which is abundant in the bay and the rivers and creeks flowing into it, asserting that it is poisonous. *Acipenser brachyrhynchus* is always in season, and always abundant, the weight of its flesh sold in the markets probably exceeding that of any other single species, excepting, perhaps, *Oncorhynchus quinnat*. It attains a very large size. On February 25th of this year I measured an individual 9' 9" long, the weight of which was 427 pounds. But even this was exceeded by a specimen brought to the California Market Christmas, 1878, measuring nearly twelve feet in length and weighing about 600 pounds. Examples of this size are of course rare. Caviare is manufactured in considerable quantities from the roe. Dr. Ayres describes a third species, *Acipenser medirostris*, but I have not yet recognized it.

SUBCLASS ELASMOBRANCHII.

The animals belonging to this class are commonly called fishes, but are distinguished by so many peculiarities of structure that they may be regarded as a subclass. This subclass contains the sharks, the rays, and the *Chimæroids*, examples of each of which groups may be found upon our coast.

In these fishes the skull is formed of cartilage alone, and no membrane bones (such as the parietal, frontal, etc.) are developed in relation to it: the gills are not free; the branchial openings are slit-like, and, (except in the *Holocephali*, or *Chimæroids*), several in number, there are no scales, but the external hard parts are what is known as placoid, composed of calcified papilla; and the eggs are few and large; some are ovo-viviparous. The minute structure of these placoid points or scales is precisely the same as that of teeth, which are also dermal in their origin. In the *Holocephali* the upper jaw and its suspensorial cartilages are wanting in a separate condition, as the parts representing them are united into a continuous cartilaginous plate, which is

continuous also with the skull itself; and the branchial clefts are covered by an opercular membrane, so that the opening is single; but in the sharks and rays, which form by far the largest order, the upper jaw and the suspensorial cartilage are distinct from each other, and are moveable upon the skull, and there are several gill openings. The teeth are usually numerous, whereas in the *Chimæras* they are not more than six in number.

There is no doubt that the sharks and rays are good for food; they may not be so delicate as a flat-fish or a salmon, but they would furnish an acceptable and wholesome addition to our food stock. One species, *Raia binoculata*, the common skate of our coast, is habitually eaten; the Chinese eat other species; the poor people along the sea-coast of England eat dog-fishes; shark's fins are a delicacy in China. If the prejudice against them could be removed, the consumption of these destructive fishes would aid greatly in reëstablishing the balance of life in the waters. What chance have our more prized fishes to perpetuate their race, when, in addition to the numerous enemies they previously had to contend with, man comes with his small-meshed nets, kills twenty young for every adult he needs for food; and in addition to this, artificially keeps up a colony of sea-lions at the entrance of the bay, while he neglects to take or kill the destructive sharks and rays, or to thin the schools of porpoises that revel in fish slaughter. Not that it would be advisable to destroy the colony of sea-lions which form one of San Francisco's greatest attractions, but it needs judicious thinning.

The commonest species of sharks found in the bay and its neighborhood are *Triacis semifasciatus*, the striped or tiger shark, which may readily be known by the dark stripes that descend from the back towards the belly, and which attain a length of more than five feet. *Mustelus*, Gill, a smaller species of uniform color; *Hexancus indicus* (= *Notorhynchus maculatus*, Ayres,) with seven gill openings instead of the usual five, and very peculiar many-cusped teeth; and *Rhinobatus productus*, Ayres, with very large pectorals, approaching the skates in form, but with the hinder part of the body shark-like. *Squatina angelus*, the angel-fish or monk-fish, of singular form and forbidding aspect, with a mouth that is terminal instead of underneath the head, and large pectorals, is occasionally taken.

Of rays, besides the common skate, we have *Rhinoptera vespertilio*, Ayres, a species with a thick head and an array of flat six-sided teeth, fitted together with all the regularity and closeness of a tessellated pavement. As this form has a wicked-looking serrated spine on its long tail, it is commonly called the sting-ray or stingaree. This is the species which, more than any other of its class, commits depredations on the oyster beds so industriously planted along the shores of our bay. A species of torpedo is sometimes met with, but is rare. Of the curious *Holocephali*, so called because the cartilage of the head is all in one piece, we have *Chimæra colliciei*, Bennett, *Hydrolagus colliciei*, Gill, a species which is distributed widely along the Pacific coast, and has occasionally been taken near San Francisco.

Raia binoculata, Girard, Skate—This alone, among the numerous rays and sharks which inhabit the bay, is brought to market regularly as an article of food. It is a very near relation of *Raia batis*, but the spines upon the head differ from those of that species. Many specimens have on each pectoral fin a large sub-circular black ring enclosing a black spot of similar form, but this is by no means constant, since though present in some examples eighteen inches or more across the fins, it is often wanting in much smaller specimens. A

parasitic *Lernean* is sometimes attached to the ventrals. The skate is abundant in the bay, and is also taken at various points along the coast.

CLASS MARSIPOBRANCHII.

Under this name are included the lampreys or lamprey eels, and the myxines or hags, two tribes which differ from other fishes so widely that naturalists consider them a separate class. The body is long and worm-like, without a trace of the paired fins, pectorals and ventrals, which are the homologues, be it remembered, of our own limbs; but with the vertical fins, dorsal, anal, and caudal, more or less developed. But the greatest structural differences lie deeper. The whole class has an incompletely developed skull, without a trace of a lower jaw; the mouth is a round opening formed for suction, and the gills are purse-shaped, usually seven on each side. There is only a single nasal opening, which is central. In the *Petromyzontide* or lampreys the branchial sacs and openings are seven on each side, the intestine has a spiral valve, and the nasal duct is a blind sac, not penetrating the palate; the mouth is armed with horny teeth, which rest on papillae. The young of these fishes differ considerably from the adults, and were formerly described as distinct genera. In the myxines the mouth is surrounded by barbels, the intestine is without a spiral valve, and the nasal duct penetrates the palate.

None of this group are usually brought to the markets of this city, but as the rivers of California contain several species which are known as "eels," and largely eaten in some localities, they need mention among our food fishes. Eel River, in Humboldt County, is named from the abundance of these lampreys, which are highly esteemed. The species known are *Lampetra plumbea*, Gill = *Petromyzon plumbeus*, Ayres; and *Entosphenus tridentatus*, *epihexodon*, and *astori*. A Myxinoid, *Bdellostoma stoutii*, Lockington, with ten teeth in the first, and nine in the second row, occurs also in Eel River, and a small example, presumably of the same species, was caught in the Bay of San Francisco.

LIST OF THE PRINCIPAL FISHES FOUND IN THE MARKETS OF SAN FRANCISCO BETWEEN OCTOBER FIRST, EIGHTEEN HUNDRED AND SEVENTY-EIGHT, AND SEPTEMBER THIRTIETH, EIGHTEEN HUNDRED AND SEVENTY-NINE.

The succeeding list is necessarily very incomplete, and is offered with apologies, as a commencement only, and a prelude to a more thorough catalogue. The reasons for its incompleteness are:

First—The fact that the writer had not, when the list was commenced, identified some of the known species, or detected the presence of species he has since described.

Second—The inability of the writer to be in the markets every morning early. The fish from Tomales, and places near the bay, arrive about 12:30 P. M., those from Monterey and more distant parts, about 4:30 P. M. The writer has visited the markets twice or thrice a week on the average, usually about 12:30 P. M. At that hour the mackerels and other fish from the south are usually all sold off, and it is probable that several of the rarer fishes occurred more frequently than he is aware of.

It must be remembered that the list refers only to the comparative abundance or scarcity of the various species in the markets, and, therefore, at least in the case of such fishes as the *Blennioids*, *Cottoids*, etc., not in great repute as food fishes, furnishes no index for their abundance in the waters. Several kinds which occurred on one or two occasions only, and were then only present by accident among other fishes, are omitted from the list.

Reference: a—tolerably abundant; b—scarce, never many on the same day; ab—occurring seldom, but abundant when present.

The letter *a* does not necessarily indicate that the species is abundant, but simply that several specimens were seen on several occasions during the month.

As it was not until the latter part of the year covered by this list that I examined the two species of herring (*Clupea*) sufficiently to distinguish them at sight, I have marked with an ? those months in which I think it likely that they occurred.

The English names given are, when printed in ordinary type, those by which the species is known among the dealers; when printed in *italics* they are proposed by the writer.

FISHES—Continued.

SCIENTIFIC NAME.	ENGLISH NAME.	1879.											
		1878.											
		October	November	December	January	February	March	April	May	June	July	August	September
CLupeID.E.	<i>Coreio-mouthed Silver Smelt</i> -----	a	a	-----	a	a	a	a	a	a	a	a	a
	<i>Elongate Silver Smelt</i> -----	a	a	-----	a	a	a	a	a	a	a	a	a
	<i>Small-mouthed Silver Smelt</i> -----	a	a	a	a	a	a	a	a	a	a	a	a
	<i>Sardine</i> -----	?	?	-----	?	?	b	b	a	a	a	a	a
CYPRINID.E.	<i>Herring</i> -----	?	a	a	a	a	a	a	a	a	a	a	a
	<i>Anchovy</i> -----	?	a	a	a	a	a	a	a	a	a	a	a
	<i>Shad</i> -----	b	-----	-----	-----	-----	-----	b	b	b	b	b	b
	<i>Most sapidissima</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SILURID.E.	<i>Western Sucker</i> -----	-----	-----	-----	a	a	a	a	a	ab	-----	-----	b
	<i>German Carp</i> -----	-----	-----	ab	ab	ab	-----	-----	-----	ab	-----	-----	-----
	<i>Pike, Pike-headed Gila</i> -----	-----	b	-----	b	a	a	a	a	a	a	-----	-----
	<i>Split-tail</i> -----	-----	-----	-----	-----	-----	ab	ab	ab	ab	-----	-----	ab
SILURID.E.	<i>Small-seated Orthodon</i> -----	-----	-----	-----	-----	ab	ab	ab	-----	-----	-----	b	-----
	<i>Thick-tail</i> -----	-----	-----	-----	-----	b	b	-----	-----	-----	-----	-----	-----
	<i>Cat-fish</i> -----	-----	-----	-----	ab	ab	ab	ab	ab	ab	-----	b	a
	<i>Sturgeon, Short-nosed Sturgeon</i> -----	a	a	a	a	a	a	a	a	a	a	a	a
ELASMOBRANCHID.	<i>Tiger Shark</i> -----	-----	-----	-----	-----	-----	b	-----	-----	-----	-----	-----	-----
	<i>Dog-fish</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	b	-----	-----
	<i>Skate-shark</i> -----	-----	-----	b	-----	-----	-----	-----	-----	-----	-----	-----	-----
	<i>Monk-fish, Angel-fish</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ACIPENSERID.E.	<i>Skate</i> -----	a	a	a	a	a	a	a	a	a	a	a	a
	<i>Triakis semifasciatus</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	<i>Mustelus bimaculatus=californicus</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	<i>Rhinobatus productus</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ACIPENSERID.E.	<i>Squatina angelus</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	<i>Raja binoculata</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	<i>Clupea mirabilis</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	<i>Clupea elongatus</i> -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

NOTE.—*Clupea mirabilis*. The Herring season is at its height in November.

RECEIPTS AND EXPENDITURES.

The following is an account of receipts and expenditures since our last report:

Receipts.

November 16, 1877—By cash on hand, last report.....	\$3,563 13
February 19, 1878—By cash returned from Livingston Stone.....	30 61
November 29, 1878—By cash, warrant one-half of appropriation.....	2,500 00
February 25, 1879—By cash, warrant one-half of appropriation.....	2,500 00
August 16, 1879—By cash, warrant appropriation for this year.....	5,000 00
	\$13,593 74

Expenditures.

November 26, 1877—To paid Wells, Fargo & Company, expressage on report.....	\$0 50
November 30, 1877—To paid McKenna, expenses in making arrests.....	100 00
December 7, 1877—To paid telegrams to Sacramento.....	1 30
December 20, 1877—To paid postage and telegram.....	1 25
December 28, 1877—To paid Wells, Fargo & Company, expressage on trout, eggs, and telegram.....	51 10
December 31, 1877—To paid Woodbury, foreman at hatching-house, one month's salary.....	150 00
January 3, 1878—To paid purchase of spawning fish.....	2 30
January 8, 1878—To paid R. M. Davis, expenses in four arrests and convictions.....	200 00
January 10, 1878—To paid Jacob Underhill, hardware for hatching-house, and telegram.....	53 52
January 17, 1878—To paid Whitby, carpenter, expressage on L. L. salmon and white-fish eggs, etc.....	156 95
January 21, 1878—To paid lumber for hatching-house, and Wells, Fargo & Co. on land-locked salmon eggs.....	179 50
January 28, 1878—To paid nails, paint, etc., and expressage on fish eggs.....	63 35
January 29, 1878—To paid Palmer & Son, 25,000 trout eggs; Stone & Hooper, 45,000 trout eggs.....	251 75
February 2, 1878—To paid Whitby, carpenter, on labor, hatching-house.....	100 00
February 4, 1878—To paid Fitzpatrick, labor, one month, to 1st.....	40 00
February 5, 1878—To paid Whitby, carpenter, balance.....	92 50
February 19, 1878—To paid L. Stone, balance hatching 2,200,000 salmon.....	500 00
February 19, 1878—To paid Woodbury, one month's salary.....	150 00
February 19, 1878—To paid wire cloth, flannel, and expressage.....	58 15
March 8, 1878—To paid expressage on trout to Santa Barbara, L. L. salmon, to Summit, etc.....	22 50
March 8, 1878—To paid Underhill, hardware and furnishing hatching-house.....	160 07
March 18, 1878—To paid Wells, Fargo & Company, expressage on fish to sundry points, drayage of cans, etc.....	43 10
March 18, 1878—To paid Woodbury, salary, one month.....	150 00
March 18, 1878—To paid Fitzpatrick, salary, one month.....	60 00
March 21, 1878—To paid Clark, work on hatching-house and expressage.....	41 10
March 21, 1878—To paid land-locked salmon to Donner Lake.....	12 50
March 26, 1878—To paid Whittier & Fuller, asphaltum and drayage of cans.....	5 80
April 3, 1878—To paid Woodbury, on account, \$20; ice, \$6 50.....	26 50
April 6, 1878—To paid expressage on land-locked salmon to Tulare Lake.....	20 00
April 6, 1878—To paid labor and expenses in distributing cat-fish.....	50 00
April 15, 1878—To paid Woodbury, salary.....	145 50
April 15, 1878—To paid Fitzpatrick, labor.....	60 00
April 15, 1878—To paid Stratton, Kirkham, and Wells, Fargo & Company, for transporting cans and fish.....	24 10
April 16, 1878—To paid telegrams and drayage.....	1 50
April 17, 1878—To paid expenses in transporting trout to Alder, Nevada, and Russian River.....	36 19
April 17, 1878—To paid Myron Green for 32,000 McCloud trout eggs.....	128 00
April 27, 1878—To paid bill of Taylor & Company, for lumber for hatching-house, troughs, etc.....	76 39
May 6, 1878—To paid Fitzpatrick, in full, for labor to May 1st.....	30 00
May 6, 1878—To paid Woodbury, on account.....	20 00

May 11, 1878—To paid expressage on fish and cans, etc.	11 92
May 11, 1878—To paid Woodbury, services and sundry expenses in full	135 40
May 19, 1878—To paid Woodbury, expenses to Pit River and return	125 00
June 7, 1878—To paid Woodbury, balance expenses and telegram	11 00
June 18, 1878—To paid ice for shad, freight, and expressage, etc	8 40
August 13, 1878—To paid purchase and distribution 12,700 cat-fish in seven counties	129 75
August 14, 1878—To paid ice and expressage of fish	16 20
August 19, 1878—To paid Mr. Glashan, expenses Truckee and Tahoe	46 85
September 18, 1878—To paid Pither, procuring and distribution 5,200 cat-fish in five counties	104 00
October 1, 1878—To paid telegrams and cat-fish for San Joaquin	15 40
October 26, 1878—To paid Pither, catfish for exchange to Honolulu	13 75
November 4, 1878—To paid Woodbury, on account \$50 copying notices, telegrams, etc.	66 25
December 6, 1878—To paid Stone, hatching 500,000 salmon, telegrams, etc.	262 00
December 11, 1878—To paid Cowdery & Preston, case of Ashton vs. McLean	20 00
December 27, 1878—To paid freight and express, white-fish eggs from Michigan	24 15
January 3, 1879—To paid freight and express, white-fish eggs from Michigan	112 40
January 3, 1879—To paid Stone & Hooper, and Myron Green, trout eggs	167 20
January 3, 1879—To paid Woodbury, balance salary, flannel, and stationery	120 00
January 6, 1879—To paid wire cloth, and transporting white-fish to Tahoe	31 15
January 15, 1879—To paid L. Stone, on account purchase 2,500,000 salmon eggs	500 00
January 18, 1879—To paid expense white-fish to Reno and Tahoe	20 00
February 3, 1879—To paid Woodbury, salary for January, \$150, express, \$16 50	166 50
February 5, 1879—To paid Richardson, one month's labor, \$100; expenses on white-fish to Tulare, \$35 30	135 30
February 10, 1879—To paid Palmer & Sons, 25,000 trout eggs	63 00
February 27, 1879—To paid expenses distributing trout	30 25
March 2, 1879—To paid Richardson, one month's labor	100 00
March 6, 1879—To paid Woodbury, one month's salary, \$150 00, expenses, etc.	165 75
March 6, 1879—To paid L. Stone, balance due for 2,500,000 salmon	600 00
March 20, 1879—To paid Pither, 2,000 cat-fish, Yolo, \$42 50; Sheriff's fees, Sonoma, \$6 70	49 20
March 20, 1879—To paid expenses examining dams on Tuolumne, wire-cloth, and telegrams	13 25
March 29, 1879—To paid Woodbury, salary one month, \$150 00; distributing trout, expenses, etc.	173 50
April 8, 1879—To paid distributing trout in San Mateo and Santa Cruz, etc.	34 85
April 14, 1879—To paid Richardson, one and one-half month's labor, \$150 00; Woodbury, one-half month, \$75 00	225 00
April 14, 1879—To paid express on fish and cans	15 95
April 14, 1879—To paid Myron Green for 50,000 trout eggs	200 00
April 19, 1879—To paid Jones, transporting trout, American River	10 00
April 23, 1879—To paid for ice in transporting fish, \$21 50; tin strainer, \$3 00	24 50
May 8, 1879—To paid Stone, on account for transporting lobsters, etc., \$500 00; exchange, \$1 50	501 50
May 22, 1879—To paid telegram, \$2 00; draft of L. Stone, account for transporting lobsters, eels, etc.	805 10
June 2, 1879—To paid Pither for distributing 3,500 cat-fish in five counties	88 75
June 13, 1879—To paid cash for salt-water, telegram, and transporting fish to Lake County	18 00
June 19, 1879—To paid for transporting black bass to Crystal Springs Lake, \$1 50; L. Stone, balance, \$200 00	201 50
June 24, 1879—To paid W. N. Lockington, for services and report on marine fishes	100 00
June 27, 1879—To paid for repair of wagon broken in transporting fish	7 50
August 14, 1879—To paid Pither, for distributing 2,500 cat-fish in three counties, barrels, etc.	65 10
August 18, 1879—To paid steamer Neptune for transporting lobsters	100 00
August 26, 1879—To paid H. D. Dunn for four days' services at Collinsville	28 25
September 1, 1879—To paid for distributing 3,700 cat-fish to Pit River, Truckee, Los Angeles, and Lassen Counties	113 95
September 8, 1879—To paid Lansing, for gathering statistics, \$50 00; express, \$10 40; ice, \$10 00	70 40
September 16, 1879—To paid J. C. Frazer, 50,000 trout for Truckee, South Yuba, and American Rivers	254 30
September 23, 1879—To paid H. C. Marks on account copying report	40 00
September 28, 1879—To paid distributing 3,500 catfish, Mendocino, Solano, Nevada, Lassen, and Mono Counties	112 40
November 1, 1879—To amount on hand to balance	3,873 70
Total	\$13,593 74

This balance of \$3,873 70 remaining on hand will be expended in payment for the 2,500,000 salmon eggs now hatching on McCloud River, and in the distribution of the young fish in that stream, the Pit, and Sacramento, as well as in the necessary expenses to be incurred in hatching white-fish and other eggs donated by the United States Government.

All of which is respectfully submitted.

B. B. REDDING,
S. K. THROCKMORTON,
J. D. FARWELL,

Commissioners of Fisheries.

SAN FRANCISCO, November 1st, 1879.

LIST OF FISH COMMISSIONERS.

UNITED STATES.

Prof. Spencer F. Baird.....Washington, D. C.

ALABAMA.

Charles S. G. Doster.....Prattville.

ARKANSAS.

N. B. Pearce.....Osage Mills.

CALIFORNIA.

S. R. Throckmorton.....San Francisco.

B. B. Redding.....San Francisco.

J. D. Farwell.....Alameda.

COLORADO.

W. E. Sisty.....Brookvale.

CONNECTICUT.

W. M. Hudson.....Hartford.

Robert G. Pike.....Middletown.

James A. Bill.....Lynne.

GEORGIA.

Thomas P. James.....Atlanta.

ILLINOIS.

N. K. Fairbank.....Chicago.

S. P. Bartlett.....Quincy.

J. Smith Briggs.....Kankakee.

IOWA.

B. F. Shaw.....Anamosa.

KANSAS.

D. B. Long.....Ellsworth.

KENTUCKY.

William Griffith, President, 166 West Main St.,
Louisville.

John B. Walker.....Madisonville.

Hon. C. J. Walton.....Munfordville.

Hon. John A. Steele.....Versailles.

Hon. J. H. Bruce.....Lancaster.

P. H. Darby.....Princeton.

Dr. S. W. Coombs.....Bowling Green.

Hon. James B. Casey.....Covington.

General T. T. Garrard.....Manchester.

Hon. W. C. Allen.....Owingsville.

MAINE.

E. M. Stilwell.....Bangor.

Everett Smith.....Portland.

MARYLAND.

T. B. Ferguson, 1327 M St., Washington, D. C.

Thomas Hughlett.....Easton.

MASSACHUSETTS.

Theodore Lyman.....Brookline.

E. A. Brackett.....Winchester.

Asa French.....Boston.

MICHIGAN.

Eli R. Miller.....Richland.

A. J. Kellogg.....Detroit.

Dr. J. C. Parker.....Grand Rapids.

MINNESOTA.

1st District, Daniel Cameron.....La Crosse.

2d District, Wm. W. Sweeney, M.D.....Red Wing.

3d District, Ormsby Sweeney.....St. Paul.

MISSOURI.

I. G. W. Steedman.....2803 Pine Street, St. Louis.

John Reid.....Lexington.

Silas Woodson.....St. Joseph.

NEVADA.

H. G. Parker.....Carson City.

NEW HAMPSHIRE.

Samuel Webber.....Manchester.

Luther Hayes.....South Milton.

Albina H. Powers.....Plymouth.

NEW JERSEY.

Dr. B. P. Howell.....Woodbury.

Colonel E. J. Anderson.....Trenton.

Theodore Morford.....Newton.

NEW YORK.

R. Barnwell Roosevelt.....76 Chamber St., N. Y.

Edward M. Smith.....Rochester.

Richard U. Sherman.....New Hartford.

Eugene G. Blackford, 809 Bedford Av., Brooklyn.

NORTH CAROLINA.

L. L. Polk.....Raleigh.

S. G. Worth.....Morgantown.

NEBRASKA.

R. R. Livingston.....Plattsmouth.

H. S. Kaley.....Red Cloud.

W. L. May.....Freemont.

OHIO.

J. C. Fisher.....Coshocton.

R. Cummings.....Toledo.

L. A. Harris.....Cincinnati.

PENNSYLVANIA.

H. J. Reeder.....Easton.

Benj. L. Hewitt.....Hollidaysburg.

James Duffy.....Marietta.

John Hummel.....Selinsgrove.

Robert Dalzell.....Pittsburg.

G. M. Miller.....Wilkesbarre.

RHODE ISLAND.

Alfred A. Reid.....Providence.

John H. Barden.....Rockland.

Newton Dexter.....Providence.

SOUTH CAROLINA.

A. P. Butler-----Hamburg.

TENNESSEE.

W. W. McDowell-----Memphis.

Geo. F. Akers-----Nashville.

W. T. Turley-----Knoxville.

UTAH.

A. P. Rockwood-----Salt Lake City.

VERMONT.

M. Goldsmith-----Rutland.

Charles Barrett-----Grafton.

VIRGINIA.

Colonel Marshall McDonald-----Lexington.

WEST VIRGINIA.

Henry B. Miller-----Wheeling.

Christian S. White-----Romney.

N. M. Lowry-----Hinton.

WISCONSIN.

Governor William E. Smith-----Madison.

Philo Dunning-----Madison.

J. V. Jones-----Oshkosh.

C. L. Valentine-----Janesville.

Mark Douglas-----Melrose.

John F. Antisdel-----Milwaukee.

Christopher Hutchinson-----Beetown.

H. W. Welsher-----Madison.

BIENNIAL REPORT OF THE DIRECTORS

AND THE

TWENTY-SIXTH AND TWENTY-SEVENTH ANNUAL REPORTS

OF THE

Superintendent of the Insane Asylum of the State of California,

AT

STOCKTON.

1879.



OFFICERS OF THE ASYLUM.

DIRECTORS :

FRANK T. BALDWIN, PRESIDENTStockton.
ROBERT WATT, VICE-PRESIDENT.....San Rafael.
CALEB DORSEYStanislaus County.
S. A. HOLMESFresno County.
FRANK STEWARTStockton.

TREASURER :

WILLIAM B. AUSTINStockton.

RESIDENT OFFICERS :

G. A. SHURTLEFF, M. D.Superintendent.
W. T. BROWNE, M. D.Assistant Physician.
W. R. LANGDON, M. D.Assistant Physician.



DIRECTORS' REPORT.

INSANE ASYLUM OF CALIFORNIA, }
STOCKTON, October 10th, 1879. }

To His Excellency, William Irwin, Governor of California:

SIR: In pursuance of the official duty imposed on us by law, as Directors of the State Asylum for the Insane at Stockton, we hereby respectfully submit our biennial report for the two years ending July 1st, 1879.

We also herewith submit the two annual reports of the Superintendent of the Asylum, which together embrace the two years ending as above stated.

We beg leave to call your Excellency's attention to the remarks of the Superintendent in reference to the partial relief from the crowded state of the Asylum, obtained by the plan employed by your Excellency therefor, and the necessity of continuing the same restriction on the commitments to this institution until the number is reduced to one thousand, as originally proposed.

We also concur with the Superintendent in his recommendation that certain inferior wards, with inadequate accommodations both as to space and character, and the wooden buildings only designed for temporary use originally, but now employed ten years, should, as soon as practicable, be vacated and removed or taken down, and new and proper accommodations of brick be substituted therefor.

The Asylum during the past two years has prospered. The results of its management are highly satisfactory. The executive duties appear to have been successfully and faithfully performed, with a harmonious coöperation generally on the part of those appointed and employed to aid therein.

Expenditures have been guarded with characteristic prudence and with a view to economy, and none have been recommended or incurred which did not have the approval of the Directors, and were not only regarded as justifiable but of obvious necessity.

Some permanent and very valuable and important improvements have been advisedly recommended to be made, which were found to be so absolutely indispensable to the proper operation and protection of the female department of the institution that they were ordered to be carried out. We refer particularly to the grading and graveling the thoroughfare between the buildings of the male and female departments, without which the latter is liable in the rainy season to be inaccessible by any heavy or loaded carriage, and hence cut off from the usual method of obtaining heavy articles of supplies, and the most efficient means of extinguishing accidental or incendiary fires.

It will be observed that the cost of the maintenance of the Asylum

for the 29th fiscal year was 43 cents a day, and for the 30th fiscal year only 40 cents a day for each patient, making the average for the two years 41½ cents per capita daily. It will be seen by reference to other years that the per capita expense during the year just closed is less than it has ever been before. It may be repeated, that the 40 cents per capita embraces every expense of maintaining the Asylum—improvements and repairs for the year, and not only the bedding, food, and clothing of the patients, but the board, lodging, salaries, and wages of the physicians and employés, numbering over 100 persons in addition to the patients.

The graving and expenses incident thereto, involving the building of a new wooden stable in place of the old one, situate in the center of the street to be improved, it will be observed, were not sufficiently advanced for any part of the payment therefor to come within the 30th fiscal year, the last embraced in this report. The work was not fairly commenced until about the 1st of July, hence the bills therefor pass into the 31st fiscal year. For this reason, being able hereafter to determine more reliably the amount of surplus which may remain unexpended of the appropriation for the support of the Asylum for the 30th and 31st fiscal years, we postpone, at present, making any estimate of the amount necessary to be appropriated for its support for the following year, or the 32d fiscal year.

For further and full financial statements of the condition of the institution in that respect, we refer you to the biennial report of the Treasurer, herewith submitted and made a part of this.

F. T. BALDWIN, *President*,
ROBT. WATT, *Vice-President*,
CALEB DORSEY,
S. A. HOLMES,
FRANK STEWART,
Directors.

TREASURER'S REPORT.

OFFICE OF THE TREASURER OF THE
INSANE ASYLUM OF CALIFORNIA,
STOCKTON, July 1st, 1879. }

To the Board of Directors of the Insane Asylum of California:

GENTLEMEN: In accordance with the by-laws of the institution, I have the honor to present the following biennial report of the receipts and disbursement of all moneys, from all sources, commencing July the 1st, 1877, and ending June the 30th, 1879:

GENERAL FUND.

Receipts.

July 1, 1877, balance as per last biennial report.....	\$27,283 00
July 12, 1877, Warrant No. 2,453.....	16,666 65
August 14, 1877, Warrant No. 2,796.....	16,666 70
September 13, 1877, Warrant No. 3,033.....	16,666 65
October 13, 1877, Warrant No. 59.....	16,000 00
November 13, 1877, Warrant No. 316.....	16,000 00
December 13, 1877, Warrant No. 576.....	16,000 00
February 6, 1878, Warrant No. 1,078.....	16,000 00
February 12, 1878, Warrant No. 1,196.....	16,000 00
March 12, 1878, Warrant No. 1,759.....	16,000 00
April 12, 1878, Warrant No. 3,391.....	16,000 00
June 13, 1878, Warrant No. 5,041.....	16,000 00
July 12, 1878, Warrant No. 6,120.....	16,000 00
August 12, 1878, Warrant No. 6,469.....	18,734 08
September 13, 1878, Warrant No. 6,410.....	18,734 08
October 14, 1878, Warrant No. 6,733.....	18,734 09
January 15, 1879, Warrant No. 4,524.....	7,000 00
January 15, 1879, Warrant No. 5,254.....	16,000 00
February 16, 1879, Warrant No. 5,634.....	16,000 00
March 17, 1879, Warrant No. 5,897.....	16,000 00
April 14, 1879, Warrant No. 5,980.....	16,395 00
May 12, 1879, Warrant No. 6,332.....	16,000 00
June 12, 1879, Warrant No. 6,596.....	16,000 00
June 30, 1879, amount received from pay-patients for board and clothing:	
For the year ending June 30, 1878.....	\$8,291 29
For the year ending June 30, 1879.....	5,763 65
	14,054 94
June 30, 1879, amount received from Steward's sales:	
For the year ending June 30, 1878.....	\$1,231 41
For the year ending June 30, 1879.....	497 81
	1,729 22
	\$396,664 41

TREASURER'S REPORT—Continued.

Disbursements.

Amount paid for general support as per vouchers now on file:		
For the year ending June 30, 1878	\$189,659 98	
For the year ending June 30, 1879	174,499 34	
		\$364,159 32
Amount paid for freight on coin:		
For the year ending June 30, 1878	\$178 00	
For the year ending June 30, 1879	175 19	
		353 19
Balance in General Fund		32,151 90
		<u>\$396,664 41</u>
The indebtedness of the Asylum is as follows:		
General Fund		\$12,006 94

All of which is respectfully submitted.

Your obedient servant,

W. B. AUSTIN, Treasurer.

APPENDIX A.

TWENTY-SEVENTH ANNUAL REPORT OF THE SUPERINTENDENT.

To the Directors of the Stockton State Asylum for the Insane:

GENTLEMEN: In compliance with the law governing the management of the Stockton State Asylum for the Insane, the Superintendent thereof hereby submits his annual report of its operations for the year ending June 30th, 1879.

The following statement presents a summary of the movement of the patients during the year:

ANNUAL SUMMARY.

FROM JUNE 30TH, 1878, TO JULY 1ST, 1879.	Males.	Females.	Totals.
Number of patients July 1st, 1878.....	853	349	1,202
Number admitted during the year ending June 30th, 1879..	79	27	106
Number under care and treatment	932	376	1,308
Number discharged recovered.....	38	20	58
Number discharged improved.....	6	8	14
Number discharged unimproved	2	—	2
Number died.....	73	27	100
Number eloped	7	—	7
Discharged, died, and eloped.....	126	55	181
Number of patients remaining July 1st, 1879.....	806	321	1,127

It will be observed that the year commenced with 1,202 patients; that notwithstanding the insane of the most populous as well as the greater portions of the State were ordered to the Napa Asylum, 106 were received into this institution during the year; that 58 were restored to sanity and were discharged; that 16 were discharged who were not recovered; that the whole number under treatment was 1,308; that of these 100 died, and 7 eloped, leaving in the Asylum, at the close of the year, 1,127 patients.

Thus it will be seen there has been a decrease in our number during the year of 75 patients.

The rate of mortality is much less than it was when the Asylum received all the patients of the State, and was excessively crowded. The opening of the Napa Asylum, however, has only afforded partial relief. It is believed that the ratio of deaths may be further reduced by procuring and preserving a proper relation between the number of inmates and their room accommodations.

Twenty-five per cent. of all the deaths are from consumption and tubercular affections—diseases frequently developed and hastened to a fatal termination by crowded apartments. With this experience

I trust our Legislature will not, by a lack of provision for this class of its wards, permit this Asylum to continue, or again become, so crowded as to manifestly affect the ratio of mortality.

The ratio of recoveries to the admissions during the past year has been nearly fifty-five per cent. This is a large proportion of cures, and greater than the average of past years, or the general average in other similar institutions, either in the United States or other countries. There are, however, modifying influences, producing temporary results frequently, which cannot be sustained regularly and for a long time. For better information on this point, therefore, reference may be made to the table of general statistics, covering the entire period of the existence of the institution.

The number discharged unrecovered is very small, it being only eighteen, sixteen of whom were improved. Comparatively few patients, though they may become harmless and inoffensive, are removed from the Asylum by friends or near relatives, for the reason that a large ratio are without homes or known kindred.

The number of unreturned escapes—seven—is not large in proportion to the whole number under custody during the year, to wit, thirteen hundred and eight. Many patients are daily employed in the various kinds of work on the farm and garden and about the institution, and many are allowed the enjoyment of a circumscribed and conditional liberty about the grounds, for their amelioration and general benefit, or as an important auxiliary in the curative treatment of their maladies. Some, too late, are found to be unworthy of the trust. About as many patients, however, make their escape by violently breaking through windows and doors in the night time, or by ingenious devices to open them, as do by a breach of the confidence reposed in them in being allowed the partial freedom above referred to.

On the whole, the past year has been one of general success and desirable results. The buildings have been preserved from the ravages of fire; no serious interruption or inconvenience has occurred from the breaking or wearing out of machinery; the supply of pure water has been unfailing; the farm and garden have yielded a generous return for the labor bestowed; contracts for supplies have been obtained on favorable terms, and they have generally been faithfully fulfilled; to the extent of our authority and means, repairs and improvements have been made to keep pace with the wear and destruction of use and the demands of progress; no epidemic disease has come among us; general health has prevailed; accidents have been comparatively rare; expenditures have been kept well within the appropriations; and, in a good degree, all things connected with it have harmoniously tended to the accomplishment of the worthy end for which the State has established and liberally supported this munificent charity.

Full statistical statements of the operations of the Asylum will be found, as usual, in the appendix of this report. By reference to Table "A" thereof, it will be seen that during the past year patients have been received from twenty-one counties of the State, and that by far the largest number—more than one-third of the whole—were committed from San Joaquin County. The statistics in this respect require explanation. Patients have really come from a greater number of counties than the commitments or records show. They have been brought to Stockton from the most remote parts of the State, and

from San Francisco as well, and here examined and committed to this Asylum. The records show the counties from which they are committed, and not the place to which they belong or may have been brought before examination or commitment.

Table "B" of the appendix shows the nativity, so far as it is stated in the commitments, of the one hundred and six patients admitted during the year, including all but four. It will be observed that fifty-two were natives of the United States, and fifty were of foreign birth. This item of information has always appeared to be of general interest; but so short a period and so small a number do not present the relation between these two classes fairly and reliably. The following table, therefore, exhibiting the number of native and foreign born admitted into the Asylum annually for the ten preceding years, is here presented:

YEAR.	Born in the United States	Born in Foreign Countries
1869	179	283
1870	167	380
1871	174	333
1872	159	322
1873	131	252
1874	174	330
1875	198	399
1876	161	332
1877	88	165
1878	95	121
Totals	1,526	2,857

It is to be observed that the patients of foreign birth exceed those born in the United States in the ratio of nearly two to one.

Another subject of special interest is the causes of insanity, given in Table "E" of the appendix. There can be no reasonable doubt that intemperance is the most effective by far of any one factor in the production of mental failure and derangement. The term is used only with reference to the use of intoxicating liquors. This cause not only stands among the highest in the list, as the assigned cause, but it has a vast consequential influence not attributed to it in the tables. It produces constitutional neuroses and a hereditary predisposition to insanity in the offspring of its subjects; it is the primal author of the mischief in many instances where other causes are assigned—such as "irregular habits," "business troubles," "domestic trouble," "loss of property," "excessive vicious habits," poverty, destitution, and so forth. The varied and wide-spread influence, direct and indirect, which the habitual and intemperate use of intoxicating beverages exerts in the production of mental disease, is so manifest that any array of statistics or arguments to show it would be merely cumulative evidence in further proof of what has long been established, and is still being constantly demonstrated to the personal observation of the members of nearly every civilized community in the world.

GENERAL STATISTICS.

The following table (necessarily presented annually to keep complete this convenient and comprehensive view of the whole history of the movement of the patients) shows the whole number of admissions, recoveries, deaths, number resident at the close of each year, annual increase or decrease, ratio of recoveries and deaths from the commencement of the care of the insane in Stockton, embracing the period from August, 1851, to July 1st, 1853, when they were kept in what was then termed the Insane Department of the State General Hospital, to July 1st, 1879:

NUMBER OF ADMISSIONS, RECOVERIES, DEATHS, ETC.

YEARS.	Admissions	Recoveries	Discharged Un cured	Deaths	Escaped	Number Resident at the Close of Each Year	Increase	Decrease	Whole Number Treated	Per cent. of Recoveries to Admissions	Per cent. of Deaths on the Number Treated
1851	13	6		1		6	6		13	46.15	7.69
1852	124	50	6	10		62	56		130	40.32	7.69
1853	160	108	8	12		103	41		222	67.50	5.40
1854	202	150	13	21		134	31		305	74.00	6.89
1855	214	168	16	18		162	28		348	78.50	5.20
1856	210	126	15	23		172	10		382	60.00	6.02
1857	206	81	17	28		188	16		378	39.32	7.33
1858	244	112	20	32		273	85		432	45.90	7.41
1859	276	112	22	49		370	97		549	40.58	8.91
1860	248	123	21	54	10	417	47		618	49.59	8.73
1861	198	154	34	33	14	416		1	615	77.77	5.36
1862	301	127	14	65	12	499	83		717	42.19	9.06
1863	252	105	17	47	12	583	84		751	41.67	6.26
1864	219	101	25	82	12	581		2	802	46.12	10.22
1865	268	93	15	82	27	632	51		849	34.70	9.66
1866	279	131	13	62	12	693	61		911	46.95	6.81
1867	313	125	14	89	9	769	76		1,006	40.00	8.80
1868	387	146	13	134	10	853	84		1,156	37.73	11.59
1869	482	225	16	159	15	920	67		1,335	46.68	11.91
1870	562	221	36	156	22	1,047	127		1,482	39.32	10.55
1871	523	245	36	176	23	1,090	43		1,570	46.84	11.21
1872	506	240	33	188	12	1,123	33		1,596	47.43	11.78
1873	401	185	19	152	12	1,156	33		1,524	46.13	9.97
1874	524	209	46	178	23	1,224	68		1,680	39.88	10.59
1875	615	259	71	181	26	1,302	78		1,839	41.95	9.84
1876	414	252	60	172	18	1,214		88	1,716	61.26	10.03
1877	201	83	30	100	7	1,195		19	1,415	41.29	7.06
1878	219	80	19	106	7	1,202	7		1,414	36.53	7.49
1879	106	58	16	100	7	1,127		75	1,308	54.71	7.64
Totals	8,667	4,075	665	2,510	290		1,312	185			

These statistics show that 8,667 patients have been admitted; that 4,075 have recovered and been discharged; 665 have been discharged as sufficiently improved to be restored to liberty or to be removed; 2,510 have died, and that 290 have eloped. The elopes have to a great extent been returned by new commitments.

The ratio of recoveries is 47 per cent. on the whole number admitted.

The plan pursued by the Governor to relieve this Asylum of its overcrowded condition, and to numerically equalize the two State Asylums, by requiring a large proportion of the counties to send their insane to the new Asylum, has been a great relief to this institution. Circumstances, however, have prevented so rapid a reduction as was contemplated. Yet the amelioration of our condition is so sensibly felt that the course of the Executive must be gratefully acknowledged to have had in a good degree the desired effect. It was estimated and hoped at the commencement of this biennial period just closed that, by this plan, the number of patients in the Asylum would be reduced to 1,000 in about two years. It will be observed that this expectation is not realized by 127 patients, the present number being 1,127. It is not practicable, nor was it intended to adhere absolutely and without any exercise of discretion, on the part of committing magistrates, to the plan of sending the patients from certain counties, including nearly the whole State, to the Napa Asylum. In this respect the unfortunate are dealt with, properly, in a spirit of accommodation and condescension. This being an old institution many had been here before, who, upon suffering a return of their malady, might prefer, or their friends for them, to be returned to the place where they were acquainted and had been before restored. This fact, and an occasional diversion or local interruption of travel in the inclement season, have caused rather more patients to be committed here, from the counties designated for accommodation at the other Asylum, than was anticipated. Furthermore, the falling off of the admissions to this Asylum, resulting from sending them in the main to Napa, has gradually operated to drain the Stockton Asylum of its curable cases. It is, though still crowded, filled principally with the class of patients called chronic and incurable. The number of recoveries depends on the number of recent and curable cases, and not on the aggregate number in the institution. Hence the absolute number of discharges by recovery must be comparatively small in this Asylum—small in proportion to the whole number of patients, though the annual ratio of recoveries to the annual admissions may be large.

If, then, the plan of relief wisely and humanely adopted by the Governor be continued, it will take at least two years more to reduce the number of inmates of this Asylum to 1,000, as designed; and without additional room and facilities for their care, it will be detrimental to the welfare of its inmates and defeat the humane plan now in successful progress for the required improvement in their situation, to stop short of the degree of relief contemplated, while to allow any considerable increase of the existing number in the present buildings would be a manifest wrong, and scarcely less than a culpable cruelty on the part of anybody who possesses the authority to prevent it.

We may calculate, with about as much certainty as we can depend on the operation of any law in social science, that the insane will increase with the increase of the general population, and that California will require accommodations for one insane person to about every 450 of her general population. It is for our Legislature to consider these facts, with a just regard to the increasing burdens of the Napa Asylum, and in the light of the axiom that the insane are the wards of the State and that it is its duty to provide for their protection and proper care. For my own part I see no way of preparing for the

impending exigencies but by increased accommodations of a substantial character, but of such plain and economical style as best becomes the architecture of buildings designed for public charity and erected at public expense.

With no prospect of reducing the numerical size of this Asylum to less than a thousand, and with the certainty of having to care for a greater number for some time to come, it is manifest that it should be put and kept in the best possible condition for the great work it has to perform—to secure the welfare and reasonable comfort of the vast number of our unfortunate fellow-beings, whom we necessarily compel to live therein. I must repeat in this connection the recommendation made in my annual report of 1877, to wit: "That for greater security against fire, brick structures, in more immediate connection with the main Asylum buildings, be substituted for the wooden ones."

The wooden buildings referred to above are cheap structures, erected as temporary expedients at a time when there was no room, not even surface room, on the floors for the increasing patients, and no appropriation or law for the erection of proper buildings. They have more than paid for themselves every year since in the saving of interest on what first-class accommodations in other places have been made to cost per patient. They were put up in 1869, at an expense of about \$15,000. They have accommodated ever since an average of 160 patients. The old one-story brick structures, in the rear of the wings of the main Asylum buildings of the male department, formerly called "mad-houses," I have to repeat, should be enlarged and improved so as to entirely change their character and appearance, or they should be taken down and their use abolished. They are disgracefully below any modern standard of accommodations, even for the class of patients for whom they were designed. They would not now be occupied were there any other room for the inmates they contain.

Other improvements recommended in my last published report having become indispensable to the proper and safe operation of the Asylum—such as graveling the streets between the male and female departments, and the removal of the old wooden building situated in the thoroughfare leading to the latter—have been recently authorized by your Board.

The work is laid out, the best of material secured for graveling, and the whole projected improvement is progressing; and, at the present time, there is a most favorable prospect of its completion in a most durable and satisfactory manner before the commencement of the rainy season. Most that has been done, however, is of a preliminary character, hence the cost thereof will appear mainly in the 31st fiscal year.

The expense of the Asylum during the past year has been even less than in 1877, and is, therefore, in proportion to the number of patients, less than ever before. It has been only 40 cents per capita a day. This includes every expenditure—salaries of physicians, the pay of all employés, cost of repairs, improvements, and the whole expense of carrying on the Asylum. Out of this the patients were better fed than formerly, as well clothed, and had everything necessary to their comfort and proper treatment, excepting space or room in the buildings of the male department, parts of which have been for years, and, in a less degree, are still, oppressively crowded, and

of a character poorly fitted for the uses for which they have to be employed, as heretofore stated.

In conclusion, you will please accept an expression of my gratitude for repeated tokens of your confidence; for the spirit of coöperation manifested; for your prompt attention to all my calls upon your official authority; and for your wise counsel and valuable aid in the discharge of the executive management of this great public charity intrusted to our common care.

G. A. SHURTLEFF,
Medical Superintendent, State Asylum for the Insane.

STOCKTON, CALIFORNIA, July 15th, 1879.

TABLE A.

Showing the counties from which one hundred and six patients were admitted, from July 1st, 1878, to July 1st, 1879.

COUNTIES.	Males.	Females.	Totals.
Alameda	2	1	3
Alpine	1		1
Amador	4	1	5
Calaveras	3	2	5
Fresno	2	2	4
Kern	1		1
Lake	1		1
Merced	8	1	9
Nevada		1	1
Placer	1	1	2
Sacramento	1		1
San Bernardino	1		1
San Francisco	1	2	3
San Joaquin	26	10	36
Santa Clara	4	2	6
Stanislaus	9		9
Tehama	2		2
Tulare	6	3	9
Tuolumne	2	1	3
Ventura	2		2
Yuba	2		2
Totals	79	27	106

TABLE B.

Showing the nativity of one hundred and six patients admitted, from July 1st, 1878, to July 1st, 1879.

NATIVITY.	Males.	Females.	Totals.
<i>United States.</i>			
California	4	3	7
Connecticut	1	-----	1
Georgia	1	-----	1
Illinois	1	2	3
Indiana	1	-----	1
Iowa	1	-----	1
Maine	-----	1	1
Massachusetts	5	1	6
Maryland	2	-----	2
Missouri	2	2	4
New Jersey	-----	1	1
New York	5	3	8
Ohio	6	2	8
Pennsylvania	1	-----	1
Tennessee	2	-----	2
Vermont	1	-----	1
Virginia	1	1	2
District of Columbia	-----	1	1
America	1	-----	1
Totals	35	17	52
<i>Foreign Countries.</i>			
Austria	2	-----	2
China	2	1	3
England	1	1	2
France	4	-----	4
Germany	7	1	8
Ireland	14	1	15
Italy	3	1	4
Japan	1	-----	1
Mexico	3	3	6
Portugal	1	-----	1
Scotland	-----	1	1
Sweden	2	-----	2
Switzerland	-----	1	1
Unknown	4	-----	4
Totals	44	10	54

RECAPITULATION.

NATIVITY.	Males.	Females.	Totals.
United States	35	17	52
Foreign countries	40	10	50
Unknown	4	-----	4
Totals	79	27	106

TABLE C.

Showing the ages at which insanity first appeared in one hundred and six patients admitted from July 1st, 1878, to July 1st, 1879.

AGES.	Males.	Females.	Totals.
Less than 10 years -----	1	-----	1
Between 15 and 20 years -----	1	6	7
Between 20 and 25 years -----	10	2	12
Between 25 and 30 years -----	15	3	18
Between 30 and 35 years -----	13	6	19
Between 35 and 40 years -----	13	2	15
Between 40 and 45 years -----	7	2	9
Between 45 and 50 years -----	3	3	6
Between 50 and 55 years -----	5	1	6
Between 55 and 60 years -----	6	1	7
Between 60 and 70 years -----	3	-----	3
Over 70 years -----	-----	1	1
Unknown -----	2	-----	2
Totals -----	79	27	106

TABLE D.

Showing the ages of one hundred and six patients at the time of their admission from July 1st, 1878, to July 1st, 1879.

AGES.	Males.	Females.	Totals.
Between 10 and 15 years -----	1	-----	1
Between 15 and 20 years -----	1	2	3
Between 20 and 25 years -----	5	3	8
Between 25 and 30 years -----	13	4	17
Between 30 and 35 years -----	17	2	19
Between 35 and 40 years -----	10	4	14
Between 40 and 45 years -----	6	3	9
Between 45 and 50 years -----	8	5	13
Between 50 and 55 years -----	7	1	8
Between 55 and 60 years -----	5	1	6
Between 60 and 65 years -----	2	1	3
Between 65 and 70 years -----	2	-----	2
Over 70 years -----	-----	1	1
Unknown -----	2	-----	2
Totals -----	79	27	106

TABLE E.

Showing the supposed cause of insanity of one hundred and six patients, as stated in commitments, from July 1st, 1878, to July 1st, 1879.

SUPPOSED CAUSES.	Males.	Females.	Totals.
Hereditary	7	2	9
Intemperance	8	—	8
Masturbation and irregular habits	7	—	7
Business troubles	6	—	6
Epilepsy	3	—	3
Syphilis and irregular life	3	—	3
Religious excitement	1	2	3
Injury to head	2	—	2
Religion and intemperance	2	—	2
Puerperal state	—	2	2
Overwork in heated term	1	1	2
Domestic trouble	1	1	2
Domestic trouble and intemperance	—	1	1
Domestic trouble, injury to head, and sunstroke	1	—	1
Inflammation of the brain	1	—	1
Exposure	1	—	1
Long continued intermittent fever	1	—	1
Bilious fever	—	1	1
Loss of husband and property	—	1	1
Ill health	—	1	1
Chorea	—	1	1
Epilepsy, opium, and family troubles	—	1	1
Gunshot wound	1	—	1
Measles	—	1	1
Spiritualism and Mormonism	1	—	1
Spiritualism and nymphomania	—	1	1
Sunstroke	1	—	1
Excesses in vicious habits	—	1	1
Intemperance and venery	1	—	1
Grief on death of husband	—	1	1
Loss of money in stocks	1	—	1
Elopement of daughter	—	1	1
Unknown	29	8	37
Totals	79	27	106

TABLE F.

Showing the class of insanity of one hundred and six patients, at the time of their admission, from July 1st, 1878, to July 1st, 1879.

FORM OF DISEASE.	Males.	Females.	Totals.
Mania	38	18	56
Monomania	9	2	11
Melancholia	8	1	9
Dementia	24	6	30
Totals	79	27	106

TABLE G.

Showing the civil condition of one hundred and six patients, at the time of their admission, from July 1st, 1878, to July 1st, 1879.

CIVIL CONDITION.	Males.	Females.	Totals.
Married	18	17	35
Single	53	7	60
Widows		3	3
Widowers	2		2
Unknown	6		6
Totals	79	27	106

TABLE H.

Showing the occupation of one hundred and six patients, admitted from July 1st, 1878, to July 1st, 1879.

OCCUPATION.	Males.	Females.	Totals.
Laborers	21		21
Housewives		17	17
Farmers	6		6
Miners	6		6
Cooks	4		4
Sheep-herders	3		3
Servant girls		3	3
Stock raisers	2		2
Druggists	2		2
Gardeners	2		2
Carpenters	2		2
Shoemakers	2		2
Blacksmiths	2		2
Tailor	1		1
Teamster	1		1
Painter	1		1
Telegraph operator	1		1
Artist	1		1
Lawyer	1		1
Clerk	1		1
Wagon maker	1		1
Farm hand	1		1
Sausage maker	1		1
Plumber	1		1
Justice of the Peace	1		1
Merchant	1		1
Baker	1		1
Musician	1		1
Waiter in hotel	1		1
Dentist	1		1
Clergyman	1		1
Marble polisher	1		1
Loose woman		1	1
Teacher		1	1
No occupation	2	5	7
Unknown	6		6
Totals	79	27	106

TABLE I.

Showing the cause of death of one hundred patients during the year, from July 1st, 1878, to July 1st, 1879.

Month.	CAUSE OF DEATH.	Nativity.	Age.	Males	Females
July, 1878	Consumption	Unknown	Unknown	1	---
July, 1878	Dysentery	Virginia	55	1	---
July, 1878	Acute mania	China	Unknown	1	---
July, 1878	Paralysis	Ireland	37	1	---
July, 1878	Gastro-enteritis	France	39	---	1
July, 1878	Tuberculosis	France	27	1	---
July, 1878	Marasmus	Germany	51	1	---
July, 1878	Consumption	Mexico	40	1	---
July, 1878	Choked by impact of food in a paralytic throat	Missouri	40	---	1
July, 1878	Paralysis	Great Britain	63	1	---
July, 1878	Consumption	California	27	---	1
August, 1878	Consumption	Sweden	32	1	---
August, 1878	Organic disease of brain	Germany	38	---	1
August, 1878	Consumption	Massachusetts	36	---	1
August, 1878	Organic disease of brain	Ireland	36	1	---
August, 1878	Anasarca	Kentucky	52	1	---
August, 1878	Paralysis	Ireland	35	1	---
August, 1878	Enteritis	Halifax	49	1	---
September, 1878	General paralysis	Ireland	46	1	---
September, 1878	Typho-malarial fever	Scotland	61	1	---
September, 1878	Paralysis	Massachusetts	49	1	---
September, 1878	Consumption	Ireland	68	---	1
September, 1878	Consumption	Ireland	43	---	1
October, 1878	Paralysis	Massachusetts	50	1	---
October, 1878	Epilepsy	Ireland	42	---	1
October, 1878	Consumption	Germany	40	1	---
October, 1878	Consumption	Switzerland	39	1	---
October, 1878	Consumption	New York	28	---	1
November, 1878	Consumption	Alabama	26	---	1
November, 1878	Organic disease of brain	Germany	22	1	---
November, 1878	Organic disease of brain	Illinois	36	1	---
November, 1878	Paralysis	China	40	1	---
November, 1878	Anasarca	Mexico	45	---	1
November, 1878	Epilepsy	California	10	1	---
November, 1878	Disease of liver	Germany	31	1	---
December, 1878	Organic disease of brain	Unknown	19	1	---
December, 1878	General paralysis	Prussia	42	1	---
December, 1878	Organic disease of brain	Maine	51	1	---
December, 1878	Paralysis	Massachusetts	34	1	---
December, 1878	Organic disease of brain	Unknown	32	---	1
December, 1878	Maniacal exhaustion	Prussia	28	1	---
December, 1878	Scrofulosis	Virginia	37	---	1
December, 1878	Paralysis	Unknown	42	---	1
December, 1878	Paralysis	Kentucky	49	1	---
December, 1878	Organic disease of brain	Prussia	53	1	---
December, 1878	Consumption	Ireland	47	1	---
January, 1879	Apoplexy	England	41	---	1
January, 1879	Paralysis	Ireland	67	---	1
January, 1879	Decay of old age	Ireland	65	1	---
January, 1879	Consumption	Ireland	44	1	---
January, 1879	Tabes mesenterica	England	34	1	---
January, 1879	Consumption	Sweden	30	1	---
January, 1879	Consumption	Ireland	36	---	1
January, 1879	Consumption	Missouri	51	1	---
January, 1879	Epilepsy	California	23	1	---
January, 1879	Consumption	China	28	1	---
February, 1879	Organic disease of brain	Iowa	38	1	---
February, 1879	Exhaustion from acute mania	Ireland	30	1	---
February, 1879	Organic disease of brain	Ireland	37	1	---
February, 1879	Dysentery	Sweden	30	1	---
February, 1879	Cerebral effusion	England	45	1	---

TABLE I—Continued.

Month.	CAUSE OF DEATH.	Nativity.	Age.	Males	Females
February, 1879..	Paralysis	China	54	1	---
February, 1879..	Abscess of liver	Ireland	42	---	1
February, 1879..	Decay of old age	Mexico	76	---	1
February, 1879..	Maniacal exhaustion	Indiana	42	---	1
February, 1879..	Consumption	Ireland	30	1	---
March, 1879.....	Epilepsy	Illinois	32	---	1
March, 1879.....	Maniacal exhaustion	Virginia	60	1	---
March, 1879.....	Consumption	Kentucky	62	1	---
March, 1879.....	Apoplexy	France	39	1	---
March, 1879.....	Tuberculosis	Ireland	30	---	1
March, 1879.....	Organic disease of brain	Norway	52	1	---
March, 1879.....	Consumption	Unknown	Unknown	1	---
March, 1879.....	Paralysis	England	57	1	---
March, 1879.....	Anasarea	Ireland	52	1	---
March, 1879.....	Dysentery	Chili	57	1	---
March, 1879.....	Tabes mesenterica	Michigan	42	1	---
March, 1879.....	Decay of old age	Ireland	76	1	---
April, 1879.....	Paralysis	China	37	1	---
April, 1879.....	Paralysis	Pennsylvania	65	1	---
April, 1879.....	Heart disease	Unknown	Unknown	1	---
April, 1879.....	Anasarea	Sclavonia	41	1	---
April, 1879.....	Paralysis	China	46	1	---
April, 1879.....	Paralysis	Ireland	41	1	---
April, 1879.....	Displacement of bowels	Maryland	39	1	---
May, 1879.....	Pneumonia	Massachusetts	30	1	---
May, 1879.....	Organic disease of brain	Ireland	58	1	---
May, 1879.....	Disease of liver	Ireland	37	1	---
May, 1879.....	Exhaustion from acute melan- cholia	Germany	49	---	1
May, 1879.....	Exhaustion from acute mania	China	47	---	1
May, 1879.....	Paralysis	New York	71	1	---
May, 1879.....	Pneumonia	Ohio	34	1	---
June, 1879.....	Scirrhus of stomach	United States	45	1	---
June, 1879.....	Paralysis	England	53	1	---
June, 1879.....	Cerebral effusion	Ireland	47	---	1
June, 1879.....	Maniacal exhaustion	China	27	1	---
June, 1879.....	Consumption	England	35	1	---
June, 1879.....	Consumption	China	Unknown	1	---
June, 1879.....	Apoplexy	Ireland	65	---	1
June, 1879.....	Heart disease	Ireland	45	---	1

TABLE J.

Recapitulation of cause of death of one hundred patients during the year, from July 1st, 1878, to July 1st, 1879.

CAUSE OF DEATH.	Males.	Females.	Totals.
Consumption	15	7	22
Paralysis	16	2	18
Organic disease of brain	10	2	12
Maniacal exhaustion	5	2	7
Anasarca	3	1	4
Epilepsy	2	2	4
Dysentery	3	—	3
Decay of old age	2	1	3
Apoplexy	1	2	3
General paralysis	2	—	2
Disease of liver	2	—	2
Tabes mesenterica	2	—	2
Pneumonia	2	—	2
Tuberculosis	1	1	2
Cerebral effusion	1	1	2
Heart disease	1	1	2
All other causes	5	5	10
Totals	73	27	100

TABLE FIRST.

Account of articles consumed and current expenditures in the Asylum for the year ending with June 30th, 1879.

ARTICLES.	Values.
Flour	\$11,306 81
Meat	11,949 90
Sugar	5,770 17
Tea	1,557 73
Syrup	1,178 40
Potatoes	5,011 61
Butter	5,757 85
Coffee	2,029 84
Lard	415 00
Fish	894 53
Poultry and eggs	385 40
Beans and peas	782 05
Rice and cracked wheat	909 52
Corn meal and middlings	492 75
Fruit	630 68
Vegetables	34 32
Salt	172 35
Vinegar	160 30
Small groceries	1,531 88
Soap and potash	1,339 20
Drugs	1,907 72
Liquor	938 25
Tobacco	1,897 55
Dry goods	2,012 49
Clothing and hats	9,210 85
Shoes and leather	2,212 85
Blankets	1,588 85
Furniture and crockery	996 51
Hardware and tinware	980 77
Carried forward	\$74,056 13

TABLE FIRST—Continued.

ARTICLES.	Values.
Brought forward	\$74,056 13
Grain and feed	1,509 09
Garden tools and seeds	211 52
Lumber	621 70
Building material and repairs	1,421 88
Brooms and brushes	504 01
Books and stationery	415 27
Oil and gas	1,893 60
Paints, oils, and glass	534 76
Fuel	11,751 86
Bedding	2,257 47
Castings, pipes, and iron	1,377 05
Discharged patients	148 55
Returned escapes	108 00
Pay-roll and wages	70,513 56
Miscellaneous	1,833 83
Total	\$169,158 28

TABLE SECOND.

Showing the cost of the different departments for the year ending with June 30th, 1879.

DEPARTMENTS.	Cost.
Male kitchen and dining-room	\$28,259 67
Male department	48,245 38
Female kitchen and dining-room	16,765 89
Female department	30,799 77
Bakery	11,852 47
Laundry and engine-house	5,389 84
Farm, garden, and dairy	5,549 07
Repairs	2,577 09
Medical Superintendent	5,054 55
First Assistant Physician	4,300 03
Second Assistant Physician	4,300 03
Miscellaneous	6,064 49
Total	\$169,158 28

TABLE THIRD.

Averages.

MONTHS.	Average Number of Pa- tents on Hand Daily.	Average Daily Expenses.	Average Cost per Capita per Day (Cents).	Average Cost per Capita per Month.
July, 1878.....	1,199	\$422 37	35	\$10 92
August, 1878.....	1,191	465 83	39	12 12
September, 1878.....	1,183	471 61	40	11 96
October, 1878.....	1,182	493 63	41	12 94
November, 1878.....	1,184	535 41	45	13 56
December, 1878.....	1,177	464 44	40	12 23
January, 1879.....	1,172	466 10	40	12 33
February, 1879.....	1,164	511 30	44	12 30
March, 1879.....	1,160	475 26	41	12 70
April, 1879.....	1,148	429 89	37	11 23
May, 1879.....	1,142	423 28	37	11 49
June, 1879.....	1,133	406 52	36	10 77
Yearly average.....	1,170	\$463 45	40	\$12 05

TABLE FOURTH.

Products of the farm, garden, and dairy, for the year ending with June 30th, 1879.

ARTICLES.	Amount.
Beets, pounds.....	7,220
Tomatoes, pounds.....	47,070
Turnips, pounds.....	51,840
Pumpkins and squashes, pounds.....	19,150
Beans and peas, pounds.....	5,993
Other vegetables, pounds.....	221
Other vegetables, bunches.....	1,571
Corn and cucumbers, dozens.....	4,841
Cabbage, pounds.....	49,593
Onions, pounds.....	20,624
Lettuce, cauliflower, and celery, dozens.....	1,121
Peppers and okra, pounds.....	3,273
Apples, pears, apricots, and plums, pounds.....	17,450
Grapes, pounds.....	26,110
Hay, tons.....	140
Fodder, tons.....	20
Pork, pounds.....	12,518
Milk, gallons.....	6,613
Eggs, dozens.....	469
Chickens, number.....	74
Pigs, number sold.....	155
Calves, number sold.....	5
Cow, number sold.....	1

APPENDIX B.

SUPERINTENDENT'S REPORT FOR THE YEAR ENDING WITH JUNE
30TH, 1873.

To the Directors of the Stockton State Asylum for the Insane :

GENTLEMEN: I hereby submit my annual report for the year ending with June 30th, 1878.

I refrain from any extended comments on the statistical facts herewith presented. It is proper, however, to remark that the per capita expense of 43 cents a day includes all the expenses of the institution for the past year, embracing food, clothing, care, and medical attendance of the patients, salaries and board of employés and of medical officers; also, repairs, improvements, and renewals, some of which were expensive and not of frequent occurrence.

I defer, also, repeating at this time the recommendations made in my last annual report, and not carried out, because another report will be submitted to you before this will be published and before your own biennial report will be made. The grading and graveling the passage-way between the male and female departments, however, is a work of such manifest necessity that I must ask you to authorize it to be done. It is necessary to the operation of the Asylum and the care and preservation of its buildings. Without it, in the winters of unusual quantities of rain, it is impossible to reach the buildings of the female department with loaded teams and with the heavy necessary supplies, such as coal, wood, etc. The same difficulty, or, I may say, barrier would obstruct the passage of fire-engines in case of fire.

The funds are ample to put the roads in excellent condition, and the law placing the institution under your "management and control," implies the authority to make the necessary expenditures to operate and preserve it. This improvement would necessitate the removal of the worthless old wooden building called the "White House." It should be removed, if for no other reason, on account of its proximity to, and endangering of the more valuable and useful structure called, the "Cottage Ward," where 160 patients or more are kept. In this thoroughfare, also, is the small old stable, now in use, which also would have to be removed or taken down. The latter course may be deemed advisable, as the old stable is inadequate to the wants of the institution, at best, and it may be more economical in the end, while changing the location, to erect a new building, both suitable for the purpose and in a proper place.

The following tabular statement is the annual summary of the movement of patients in the Asylum during the year.

G. A. SHURTLEFF,
Medical Superintendent, State Asylum for the Insane.

STOCKTON, CALIFORNIA, July 15th, 1878.

ANNUAL SUMMARY.

FROM JUNE 30TH, 1877, TO JULY 1ST, 1878.	Males.	Females.	Totals.
Number of patients July 1st, 1877.....	835	360	1,195
Number admitted during the year ending with June 30th, 1878....	167	52	219
Number under care and treatment.....	1,002	412	1,414
Number discharged recovered.....	55	25	80
Number discharged improved.....	8	10	18
Number discharged unimproved.....	1	—	1
Number died.....	78	28	106
Number eloped.....	7	—	7
Discharged, died, and eloped.....	149	63	212
Number of patients remaining July 1st, 1878.....	853	349	1,202

NUMBER OF ADMISSIONS, RECOVERIES, DEATHS, ETC.

YEARS.	Admissions.....	Recoveries.....	Discharged Improved.....	Deaths.....	Escaped.....	Number Resident at the Close of Each Year.....	Increase.....	Decrease.....	Whole Number Treated.....	Per cent. of Recoveries to Admissions.....	Per cent. of Deaths on the Number Treated.....
1851.....	13	6	—	1	—	6	6	—	13	46.15	7.69
1852.....	124	50	6	10	—	62	56	—	130	40.32	7.69
1853.....	160	108	8	12	—	103	41	—	222	67.50	5.40
1854.....	202	150	13	21	—	134	31	—	305	74.00	6.89
1855.....	214	168	16	18	—	162	28	—	348	78.50	5.20
1856.....	210	126	15	23	—	172	10	—	382	60.00	6.02
1857.....	206	81	17	28	—	188	16	—	378	39.32	7.33
1858.....	244	112	20	32	—	273	85	—	432	45.90	7.41
1859.....	276	112	22	49	—	370	97	—	549	40.58	8.91
1860.....	248	123	21	54	10	417	47	—	618	49.59	8.73
1861.....	198	154	34	33	14	416	—	1	615	77.77	5.36
1862.....	301	127	14	65	12	499	83	—	717	42.19	9.06
1863.....	252	105	17	47	12	583	84	—	751	41.67	6.26
1864.....	219	101	25	82	12	581	—	2	802	46.12	10.22
1865.....	268	93	15	82	27	632	51	—	849	34.70	9.66
1866.....	279	131	13	62	12	693	61	—	911	46.95	6.81
1867.....	313	125	14	89	9	769	76	—	1,006	40.00	8.80
1868.....	387	146	13	134	10	853	84	—	1,156	37.73	11.59
1869.....	482	225	16	159	15	920	67	—	1,335	46.68	11.91
1870.....	562	221	36	156	22	1,047	127	—	1,482	39.32	10.55
1871.....	523	245	36	176	23	1,090	43	—	1,570	46.84	11.21
1872.....	506	240	33	188	12	1,123	33	—	1,596	47.43	11.78
1873.....	401	185	19	152	12	1,156	33	—	1,524	46.13	9.97
1874.....	524	209	46	178	23	1,224	68	—	1,680	39.88	10.59
1875.....	615	259	71	181	26	1,302	78	—	1,839	41.95	9.84
1876.....	414	252	60	172	18	1,214	—	88	1,716	61.26	10.03
1877.....	201	83	30	100	7	1,195	—	19	1,415	41.29	7.06
1878.....	219	80	19	106	7	1,202	7	—	1,414	36.53	7.49
Totals.....	8,561	4,017	649	2,410	283	—	1,312	110	—	—	—

TABLE A.

Showing the counties from which two hundred and nineteen patients were admitted, from July 1st, 1877, to July 1st, 1878.

COUNTIES.	Males.	Females.	Totals.
Alameda	2	1	3
Amador	7	3	10
Butte	9	4	13
Calaveras	4	2	6
El Dorado	3	1	4
Fresno	3	—	3
Kern	3	—	3
Mariposa	6	—	6
Merced	5	—	5
Monterey	2	—	2
Placer	6	2	8
Plumas	1	—	1
Sacramento	32	13	45
San Benito	1	—	1
San Francisco	8	3	11
San Joaquin	24	7	31
Santa Clara	19	6	25
Santa Cruz	7	3	10
Shasta	5	—	5
Sierra	1	—	1
Stanislaus	2	2	4
Tehama	7	—	7
Trinity	2	—	2
Tulare	3	4	7
Tuolumne	4	—	4
Yuba	1	1	2
Totals	167	52	219

TABLE B.

Showing the nativity of two hundred and nineteen patients, admitted from July 1st, 1877, to July 1st, 1878.

NATIVITY.	Males.	Females.	Totals.
<i>United States.</i>			
Arkansas	1	—	1
California	13	6	19
Georgia	1	—	1
Illinois	4	2	6
Indiana	2	—	2
Iowa	1	—	1
Kansas	1	—	1
Kentucky	3	—	3
Louisiana	1	—	1
Maine	6	1	7
Massachusetts	4	3	7
Missouri	5	1	6
New York	5	3	8
North Carolina	1	—	1
Ohio	2	3	5
Pennsylvania	9	1	10
Tennessee	3	—	3
Texas	1	—	1
Vermont	1	—	1
Virginia	2	4	6
Wisconsin	1	3	4
District of Columbia	—	1	1
Totals	67	28	95

TABLE B—Continued.

NATIVITY.	Males.	Females.	Totals.
<i>Foreign Countries.</i>			
Austria	4	—	4
Canada	3	—	3
Chili	3	1	4
China	11	1	12
Denmark	2	—	2
England	5	—	5
France	4	—	4
Germany	22	4	26
Ireland	22	10	32
Italy	2	—	2
Mexico	—	6	6
New Brunswick	1	1	2
Norway	1	—	1
Nova Scotia	1	—	1
Prince Edward's Island	1	—	1
Portugal	1	—	1
Scotland	4	—	4
Sweden	2	—	2
Switzerland	3	1	4
Wales	2	—	2
Western Islands	3	—	3
Totals	97	24	121
<i>RECAPITULATION.</i>			
United States	67	28	95
Foreign countries	97	24	121
Unknown	3	—	3
Totals	167	52	219

TABLE C.

Showing the ages at which insanity first appeared in two hundred and nineteen patients, admitted from July 1st, 1877, to July 1st, 1878.

AGES.	Males.	Females.	Totals.
Less than 10 years	3	—	3
Between 10 and 15 years	6	1	7
Between 15 and 20 years	9	3	12
Between 20 and 25 years	14	10	24
Between 25 and 30 years	24	10	34
Between 30 and 35 years	27	8	35
Between 35 and 40 years	17	6	23
Between 40 and 45 years	23	4	27
Between 45 and 50 years	15	2	17
Between 50 and 55 years	7	1	8
Between 55 and 60 years	6	1	7
Between 60 and 65 years	4	1	5
Between 65 and 70 years	2	4	6
Between 70 and 80 years	1	1	2
Unknown	9	—	9
Totals	167	52	219

TABLE D.

Showing the ages of two hundred and nineteen patients at the time of their admission, from July 1st, 1877, to July 1st, 1878.

AGES.	Males.	Females.	Totals.
Between 10 and 15 years -----	1	-----	1
Between 15 and 20 years -----	9	2	11
Between 20 and 25 years -----	11	7	18
Between 25 and 30 years -----	21	6	27
Between 30 and 35 years -----	23	10	33
Between 35 and 40 years -----	21	6	27
Between 40 and 45 years -----	24	7	31
Between 45 and 50 years -----	19	5	24
Between 50 and 55 years -----	14	1	15
Between 55 and 60 years -----	5	2	7
Between 60 and 65 years -----	6	-----	6
Between 65 and 70 years -----	2	3	5
Between 70 and 80 years -----	2	3	5
Unknown -----	9	-----	9
Totals -----	167	52	219

TABLE E.

Showing the supposed cause of insanity in two hundred and nineteen patients, as stated in commitment, from July 1st, 1877, to July 1st, 1878.

SUPPOSED CAUSES.	Males.	Females.	Totals.
Intemperance -----	19	5	24
Masturbation -----	17	-----	17
Hereditary -----	9	2	11
Domestic trouble -----	3	4	7
Loss of property -----	5	1	6
Business trouble -----	5	-----	5
Epilepsy -----	4	1	5
Religious excitement -----	4	-----	4
Disease of brain -----	3	1	4
Inflammation of brain -----	3	-----	3
Exposure -----	3	-----	3
Want of employment -----	3	-----	3
Injury of head -----	3	-----	3
Disordered menstruation -----	-----	3	3
Puerperal -----	-----	2	2
Congenital -----	2	-----	2
Solitary habits -----	2	-----	2
Privation and hardship -----	2	-----	2
Love -----	2	-----	2
Disappointment in love -----	2	-----	2
Spiritualism -----	1	1	2
Eclampsia -----	-----	1	1
Albuminaria -----	-----	1	1
Uterine troubles -----	-----	1	1
Child-bearing -----	-----	1	1
Sickness -----	-----	1	1
Irritation of the brain -----	-----	1	1
Grief -----	-----	1	1
Paralysis -----	1	-----	1
Overworked brain -----	1	-----	1
Nervous tension -----	1	-----	1
Death of mother -----	1	-----	1
Death of wife -----	1	-----	1
Carried forward -----	97	27	124

TABLE H—Continued.

SUPPOSED CAUSES.	Males.	Females.	Totals.
Brought forward	97	27	124
Losses in mining stocks	1	—	1
Fright	1	—	1
Poverty and exposure	1	—	1
Bankruptcy	1	—	1
Nervous irritability	1	—	1
Monotonous life	1	—	1
Senility	1	—	1
Excitement of Workingmen's party	1	—	1
Excessive mental and physical exertion	1	—	1
Sunstroke	1	—	1
Opium	1	—	1
Unknown	59	25	84
Totals	167	52	219

TABLE F.

Showing the class of insanity of two hundred and nineteen patients, at the time of their admission, from July 1st, 1877, to July 1st, 1878.

FORM OF DISEASE.	Males.	Females.	Totals.
Mania	80	30	110
Monomania	22	8	30
Melancholia	20	4	24
Dementia	42	10	52
Idiocy	3	—	3
Totals	167	52	219

TABLE G.

Showing the civil condition of two hundred and nineteen patients at the time of their admission, from July 1st, 1877, to July 1st, 1878.

CIVIL CONDITION.	Males.	Females.	Totals.
Married	40	37	77
Single	111	11	122
Widows	—	4	4
Widowers	3	—	3
Unknown	13	—	13
Totals	167	52	219

TABLE II.

Showing the occupation of two hundred and nineteen patients, admitted from July 1st, 1877, to July 1st, 1878.

OCCUPATION.	Males.	Females.	Totals.
Laborers	58	—	58
Miners	28	—	28
Housewives	—	26	26
Farmers	15	—	15
Servants	1	3	4
Lawyers	2	—	2
Carpenters	2	—	2
Teamsters	2	—	2
Cooks	2	—	2
Expressmen	2	—	2
Shoemakers	2	—	2
Hunters	2	—	2
Sailors	2	—	2
Sheep-herders	2	—	2
Prostitutes	—	2	2
Tailor	1	—	1
Tailoress	—	1	1
Doctress	—	1	1
Housekeeper	—	1	1
Fisherman	1	—	1
Iron moulder	1	—	1
Carriage maker	1	—	1
Wagon maker	1	—	1
Marble polisher	1	—	1
Herdsman	1	—	1
Saloon-keeper	1	—	1
Brass finisher	1	—	1
Shipping merchant	1	—	1
Collector	1	—	1
Clerk	1	—	1
Lumberman	1	—	1
Merchant	1	—	1
Seafaring man	1	—	1
Gardener	1	—	1
Book-keeper	1	—	1
Machinist	1	—	1
Tinsmith	1	—	1
Waiter	1	—	1
Stock raiser	1	—	1
Plasterer	1	—	1
Barber	1	—	1
Music teacher	1	—	1
Brickmason	1	—	1
Physician	1	—	1
Cabinetmaker	1	—	1
Peddler	1	—	1
Clergyman	1	—	1
Quartz-mill feeder	1	—	1
Longshoreman	1	—	1
Artist	1	—	1
Capitalist	1	—	1
Blacksmith	1	—	1
Brakeman	1	—	1
None	7	12	19
Unknown	5	6	11
Totals	167	52	219

TABLE I.

Showing the cause of death of one hundred and six patients during the year, from July 1st, 1877, to July 1st, 1878.

Months.	CAUSE OF DEATH.	Nativity.	Age.	Males	Females
July, 1877	Serofula	Ireland	40	1	---
July, 1877	Consumption	Prussia	34	---	1
July, 1877	Exhaustion from acute melancholia	Ireland	28	1	---
July, 1877	Dysentery	Germany	50	1	---
July, 1877	Paralysis	Germany	31	1	---
July, 1877	Pott's disease of spine	Norway	27	1	---
July, 1877	Organic disease of brain	Ireland	31	---	1
July, 1877	General paralysis	England	59	1	---
July, 1877	Epilepsy	California	10	---	1
July, 1877	Organic disease of brain	North Carolina	46	1	---
July, 1877	Paralysis	Western Islands	43	1	---
July, 1877	Dysentery	England	36	1	---
July, 1877	Paralysis	New York	44	1	---
August, 1877	Marasmus	Ireland	58	1	---
August, 1877	Paralysis	Indiana	61	---	1
August, 1877	Serous apoplexy	Wisconsin	28	1	---
August, 1877	Organic disease of brain	Ireland	29	---	1
August, 1877	Senile decay	Kentucky	67	1	---
August, 1877	Consumption	New York	33	---	1
August, 1877	Consumption	France	32	---	1
August, 1877	Anasarca	Germany	47	1	---
August, 1877	Tabes mesenterica	Ireland	35	---	1
August, 1877	Consumption	Ireland	39	1	---
August, 1877	Consumption	Unknown	Unknown	1	---
August, 1877	Consumption	Belgium	35	1	---
August, 1877	Organic disease of brain	New York	29	1	---
August, 1877	Epilepsy	Tennessee	37	1	---
August, 1877	Suicide	Germany	34	1	---
August, 1877	Consumption	Germany	49	1	---
August, 1877	Paralysis	New York	55	1	---
August, 1877	Marasmus	China	38	---	1
August, 1877	Tabes mesenterica	Ireland	44	1	---
August, 1877	Marasmus	Italy	50	1	---
August, 1877	Consumption	Virginia	52	1	---
September, 1877	Tuberculosis	Massachusetts	33	---	1
September, 1877	Tuberculosis	Germany	30	---	1
September, 1877	Paralysis	France	64	1	---
September, 1877	Paralysis	Portugal	40	1	---
September, 1877	Apoplexy	Ireland	40	---	1
September, 1877	Organic disease of brain	Virginia	59	1	---
September, 1877	Diarrhœa	France	52	1	---
October, 1877	Disease of brain	Missouri	26	1	---
October, 1877	Consumption	Prussia	29	1	---
October, 1877	Consumption	Ireland	25	---	1
October, 1877	Paralytic stroke	Germany	66	1	---
October, 1877	Organic disease of brain	Italy	50	1	---
October, 1877	Maniacal exhaustion	Maine	45	1	---
October, 1877	Paralysis	Kentucky	53	---	1
November, 1877	Consumption	Pennsylvania	66	1	---
November, 1877	Anasarca	Chili	45	1	---
November, 1877	Senile decay	Pennsylvania	64	1	---
November, 1877	Dysentery	France	26	1	---
November, 1877	Paralysis	Connecticut	74	1	---
November, 1877	Organic disease of brain	Germany	37	---	1
November, 1877	Valvular disease of heart	France	48	---	1
November, 1877	Marasmus	Ireland	52	---	1
December, 1877	Consumption	France	43	1	---
December, 1877	General paresis	Massachusetts	43	1	---
December, 1877	Organic disease of brain	Kentucky	33	1	---
December, 1877	Paralysis	Massachusetts	68	1	---
December, 1877	Apoplexy	Germany	42	1	---

TABLE I—Continued.

Month.	CAUSE OF DEATH.	Nativity.	Age.	Males	Females
January, 1878	Organic disease of brain	England	64	1	---
January, 1878	Consumption	Ireland	44	---	1
January, 1878	Pneumonia	New York	56	1	---
January, 1878	Cerebral effusion	Chili	55	---	1
January, 1878	Paralysis	Mexico	39	---	1
January, 1878	Consumption	Kentucky	49	1	---
January, 1878	Consumption	France	43	1	---
January, 1878	Epilepsy	Ireland	36	1	---
February, 1878	Asthma	England	58	1	---
February, 1878	Organic disease of brain	Unknown	Unknown	1	---
March, 1878	Pneumonia	Switzerland	44	1	---
March, 1878	General paresis	Alabama	46	1	---
March, 1878	Consumption	England	30	1	---
March, 1878	Consumption	Sweden	28	1	---
March, 1878	Consumption	California	26	1	---
March, 1878	Organic disease of brain	Missouri	26	---	1
March, 1878	Atrophy of heart	New York	31	1	---
March, 1878	Consumption	Virginia	43	1	---
March, 1878	Marasmus	Maine	66	---	1
March, 1878	Consumption	Ireland	45	---	1
March, 1878	Paralysis	Germany	61	1	---
March, 1878	Anasarca	Ireland	39	1	---
April, 1878	Consumption	China	36	1	---
April, 1878	Epilepsy	America	57	1	---
April, 1878	Epilepsy	Iowa	20	1	---
April, 1878	Epilepsy	California	26	1	---
April, 1878	Epilepsy	China	Unknown	1	---
April, 1878	Ascites	Baden	41	1	---
April, 1878	Consumption	Missouri	44	1	---
April, 1878	Tabes dorsalis	Maryland	44	1	---
May, 1878	Consumption	California	48	---	1
May, 1878	Paralysis	Ireland	40	---	1
May, 1878	Cerebral congestion	Germany	47	1	---
May, 1878	Consumption	China	Unknown	1	---
May, 1878	Anasarca	Italy	39	---	1
May, 1878	Marasmus	France	52	---	1
May, 1878	Dysentery	Ireland	48	1	---
May, 1878	Paralysis	Ireland	45	1	---
May, 1878	Congestion of brain	Germany	46	1	---
June, 1878	Tuberculosis	Ireland	28	1	---
June, 1878	Consumption	Ireland	34	1	---
June, 1878	Scrofula	China	36	1	---
June, 1878	Heart disease	California	23	1	---
June, 1878	Scrofulosis	Norway	26	1	---
June, 1878	Tabes mesenterica	Mexico	40	---	1

TABLE J.

Recapitulation of cause of death of one hundred and six patients during the year, from July 1st, 1877, to July 1st, 1878.

CAUSE OF DEATH.	Males.	Females.	Totals.
Consumption	18	7	25
Paralysis	11	4	15
Organic disease of the brain	8	4	12
Epilepsy	6	1	7
Marasmus	2	4	6
Dysentery	4	—	4
Anasarca	3	1	4
General paresis	3	—	3
Scrofulosis	3	—	3
Apoplexy	2	1	3
Tuberculosis	1	2	3
Tabes mesenterica	1	2	3
Cerebral congestion	2	—	2
Pneumonia	2	—	2
Senile decay	2	—	2
All other causes	10	2	12
Totals	78	28	106

TABLE FIRST.

Account of articles consumed and current expenditures in the Asylum for the year ending with June 30th, 1878.

ARTICLES.	Value.
Flour	\$14,893 89
Meat	16,242 53
Sugar	5,674 93
Tea	1,528 76
Syrup	1,112 58
Potatoes	4,115 20
Butter	5,203 94
Coffee	2,073 99
Lard	345 93
Fish	1,022 84
Poultry and eggs	577 57
Beans and peas	495 89
Rice and cracked wheat	970 31
Corn meal and middlings	630 88
Fruit	679 43
Vegetables	115 84
Salt	155 82
Vinegar	201 57
Small groceries	1,705 05
Soap and potash	1,261 66
Drugs	2,260 13
Liquor	1,000 28
Tobacco	1,907 65
Dry goods	2,024 04
Clothing and hats	9,075 00
Shoes and leather	2,526 33
Blankets	1,614 90
Furniture and crockery	1,348 69
Hardware and tinware	1,259 00
Hay, grain, and feed	2,132 28
Garden tools and seed	310 23
Carried forward	\$84,467 14

TABLE FIRST—Continued.

ARTICLES.	Value.
Brought forward	\$84,467 14
Lumber	657 81
Building material and repairs	2,711 74
Brooms and brushes	518 16
Books and stationery	467 37
Oil and gas	2,047 65
Paints, oil, and glass	572 75
Fuel	16,941 35
Bedding	2,197 46
Castings, pipes, and iron	1,196 54
Improvements	516 88
Repairs and furniture at residence of Medical Superintendent	1,139 71
Discharged patients	316 25
Returned escapes	106 50
Pay-roll and wages	70,526 82
Miscellaneous	2,230 77
Total	\$186,614 90

TABLE SECOND.

Showing the cost of the different departments for the year ending with June 30th, 1878.

DEPARTMENTS.	Cost.
Male kitchen and dining-room	\$29,945 22
Male department	51,058 03
Female kitchen and dining-room	18,691 94
Female department	34,177 08
Bakery	14,893 57
Laundry and engine-house	5,589 81
Farm, garden, and dairy	6,054 35
Repairs and improvements	5,598 14
Medical Superintendent	4,959 54
First Assistant Physician	4,300 01
Second Assistant Physician	4,300 01
Miscellaneous	7,047 20
Total	\$186,614 90

TABLE THIRD.

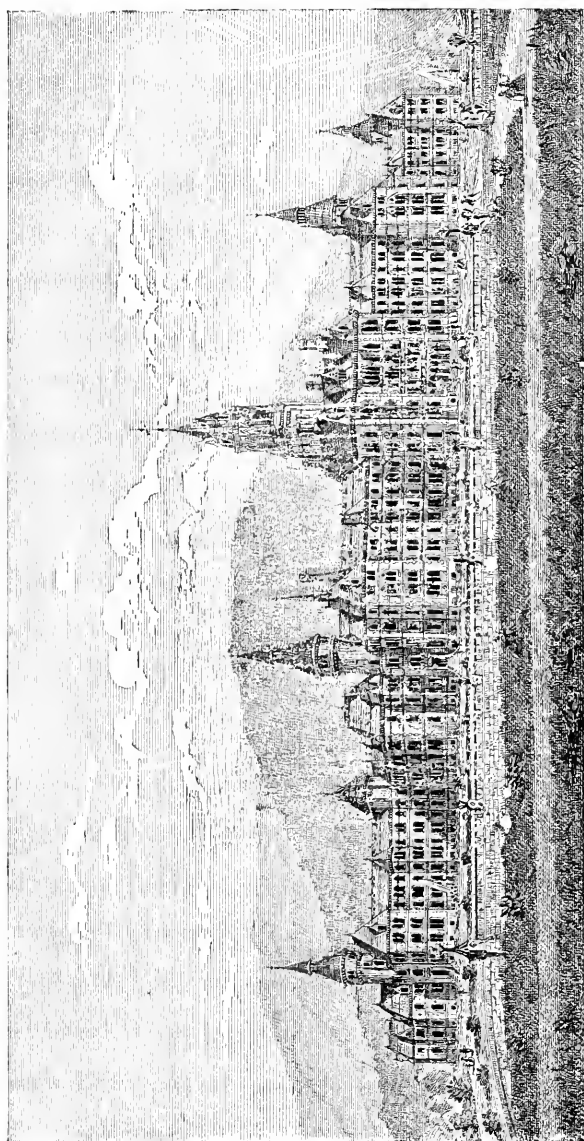
Averages.

MONTHS.	Average Number of Patients on Hand Daily -----	Average Daily Expenses -----	Average Cost per Capita per Day (Cents) --	Average Cost per Capita per Month -----
July, 1877 -----	1,198	\$490 29	41	\$12 69
August, 1877 -----	1,193	467 98	39	12 16
September, 1877 -----	1,190	469 75	39	11 84
October, 1877 -----	1,191	562 19	47	14 63
November, 1877 -----	1,190	581 74	49	14 66
December, 1877 -----	1,187	533 31	45	13 93
January, 1878 -----	1,185	488 88	41	12 79
February, 1878 -----	1,195	525 00	44	12 30
March, 1878 -----	1,202	486 68	40	12 55
April, 1878 -----	1,202	522 69	43	13 04
May, 1878 -----	1,198	518 37	43	13 42
June, 1878 -----	1,205	490 34	41	12 21
Yearly average -----	1,198	\$511 27	43	\$12 82

TABLE FOURTH.

Products of the farm, garden, and dairy, for the year ending with June 30th, 1878.

ARTICLES.	Amount.
Beets, pounds -----	38,980
Tomatoes, pounds -----	12,065
Turnips and carrots, pounds -----	75,224
Pumpkins and squashes, pounds -----	13,689
Beans and peas, pounds -----	7,081
Other vegetables, pounds -----	200
Other vegetables, bunches -----	1,625
Corn and cucumbers, dozens -----	3,615
Cabbage, pounds -----	49,873
Onions, pounds -----	22,393
Lettuce and cauliflower, dozens -----	2,722
Peppers and okra, pounds -----	1,165
Apples, pears, apricots, and plums, pounds -----	18,038
Grapes, pounds -----	19,480
Hay, tons -----	150
Fodder, tons -----	15
Pork, pounds -----	11,684
Milk, gallons -----	8,904
Eggs, dozens -----	358
Chickens, number -----	37
Hogs sold, number -----	11
Pigs sold, number -----	60
Cows sold, number -----	4
Calf sold, number -----	1
Proceeds of stock sold -----	\$813 81



Wright & Sanders, N. York.

Engraved by H. Conzelmann.

BIENNIAL REPORT OF THE TRUSTEES

AND THE

THIRD AND FOURTH ANNUAL REPORTS

OF THE

RESIDENT PHYSICIAN

OF THE

NAPA STATE ASYLUM FOR THE INSANE.

1879.



OFFICERS OF THE ASYLUM.

BOARD OF TRUSTEES :

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A. G. BOGGSNapa City.
P. VAN BEVER.....Napa City.
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JOHN BOGGS.....Colusa.

SECRETARY AND TREASURER OF THE BOARD :

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F. W. HATCH, JR., M. D.....Assistant Physician.
J. B. STEVENS.....Secretary.
J. M. PALMER.....Steward.
JOHN HAWKESSupervisor.
MRS. MARY W. ROBINSONMatron.
F. S. GRAY.....Druggist.

REPORT.

To His Excellency, William Irwin, Governor of the State of California :

We have the honor of submitting to you a statement of the expenditures in detail, and transactions of the Board of Trustees of the Napa State Asylum for the Insane, for the fiscal years 1877-8 and 1878-9, in the medical department, and from the 1st day of September, 1877, to the 1st day of October, 1879, in the department of construction, and in connection therewith make such suggestions and recommendations through you to the Legislature soon to assemble as we deem for the general welfare of the institution in our charge.

From the biennial report by us submitted to your Excellency on the 1st day of September, 1877, it appears that at that date there was a balance of \$59,000 of the appropriation theretofore made for the completion of the building (Statutes 1875-6, page 804,) remaining to our credit undrawn from the State treasury. This was an error. At the session of the Legislature above named, an Act was passed (Statutes 1875-6, page 883,) to provide a supply of water for this Asylum. By the terms of said Act the Attorney-General was authorized to institute legal proceedings for the purpose of effecting the condemnation and appropriation to the use of the Asylum of such water rights and rights of way as were necessary for the use of said institution. Upon the approval by the Governor of the valuation of such rights as fixed by the judgment in the condemnation proceedings, the Controller of State was directed by the Act to draw his warrant upon the State Treasurer, and in favor of the Board of Trustees of the Asylum, for the amount of the valuation so fixed and approved, and payable out of any moneys in the General Fund. Under this Act the Attorney-General, in September, 1876, instituted an action in the District Court of the Seventh Judicial District of the State of California, in and for Napa County, to condemn certain lands and riparian rights and rights of way for the use of the Asylum. In due time a judgment of said Court was had declaring the lands and rights necessary for the use of the Asylum, and fixing the valuation of the same, and thereafter the Governor filed in said action his written certificate approving the valuation. The amount of the valuation fixed by the judgment, together with the costs incurred in the proceeding, was the sum of \$3,248 60. The Controller drew his warrant in favor of the Board of Trustees for this sum; but instead of this warrant being drawn against the General Fund, as prescribed by the said Act, it was drawn against the fund specifically appropriated for the completion of the Asylum. For so doing the Controller assigned good and sufficient reasons. At the date of our last report we were not apprised of this action upon his part. Instead, therefore, of there being to our credit on the 1st day of September, 1877, an undrawn balance of \$50,000 in the State treasury, there was only a balance of \$46,751 40. This last named amount was in due time drawn from the State treasury; and that sum, together with a

balance of cash in the hands of our Treasurer, on the date last named, of \$2,096 11, aggregates the sum of \$48,847 51, and with which we are justly chargeable, and for which we must account. Of this, up to the 1st day of October, 1879, there has been expended the sum of \$48,648 36, leaving a balance in the hands of our Treasurer of \$199 15. The expenditures have been made from time to time in furnishing an additional supply of water for the Asylum, in the erection of gas-works, and in the purchase of gas fixtures, in fitting up unfinished portions of the building for the further accommodation of patients, in the purchase and construction of additional buildings, in the care and ornamentation of the grounds, and in the general adaptation of the buildings and their surroundings to an efficient and economical administration of the objects and purposes for which they were designed. The details of these expenditures are exhibited in the following:

Labor	\$7,657 00
Lands and water supply	20,550 79
Window guards and screens	5,341 24
Hardware	1,079 78
Rent of land and office	310 00
Salary of Clerk	226 94
Freights	113 75
Food car	288 75
Lumber and building materials	1,511 28
Blacksmith work	437 28
Purchase of building	100 00
Gas-works and gas fixtures	6,991 09
Salaries of Trustees and mileage	1,337 45
Tiling	138 00
Exchange	46 75
Mill work	291 14
Rubber hose	66 50
Shrubbery	324 73
Brick	73 50
Engineering	621 25
Elevator	450 00
Repairs	57 45
Gravel for grounds	20 00
Plumbing	567 91
Paints	35 78
Total	<u>\$48,648 36</u>

The persons to whom, as well as for what, and when, these several amounts were paid, will more definitely appear by reference to the itemized bills and vouchers on file in the office of the Board of Trustees.

The Legislature, at its last session (Statutes 1877-8, page 737), made an appropriation of \$13,420 for the purpose of paying a deficiency in the medical department of the Asylum, incurred under Dr. Bentley's administration, in the fiscal year 1875-6. This money was received by us in April, 1878, and at once applied to the purpose for which it was appropriated, payments being made to the several claimants as follows, to wit:

TO WHOM PAID.	Amount.
Haas Brothers.....	\$125 75
Hale & Company.....	175 55
H. M. Blumenthal.....	203 30
F. Borreo.....	93 09
F. Brughelli.....	46 20
G. F. Hartwell.....	51 72
M. B. Dolan.....	76 40
Joseph Henry.....	515 31
Kiefer & Smith.....	73 34
S. Lipman & Company.....	398 39
F. Meyer (Zollner & Even, assignees).....	67 25
Mellor & Sylvester.....	300 15
D. N. & E. Walter.....	206 14
West Coast Furniture Company.....	517 50
P. A. Owen (Thompson & Beard, assignees).....	51 98
O. Lawton & Company.....	248 70
H. P. Wakelee.....	523 65
F. A. Seaman (Zollner & Even, assignees).....	12 75
Record-Union.....	63 20
R. D. Watson.....	38 77
F. M. Truworthy.....	49 20
Simpson Thompson.....	46 83
Thompson & Beard.....	1,101 76
Allen & Parks (Zollner & Even, assignees).....	241 37
J. C. White (P. B. Cornwall, assignee).....	1,348 13
Dunham, Carrigan & Company.....	265 74
Mission Woolen Mills.....	793 10
Main & Winchester.....	37 05
Goodyear Rubber Company.....	42 05
J. C. White (N. Bichard, assignee).....	502 47
Murphy, Grant & Company.....	520 82
Dr. Edward Bentley.....	4,231 75
J. C. White (McKenny & Greeny, assignees).....	27 47
E. L. Mayberry.....	366 90
West Coast Furniture Company.....	42 80
Exchange on \$13,420.....	13 42
Total.....	\$13,420 00

The subject of an abundant water supply for the Asylum engaged our attention for a long time. At the outset two difficulties were presented: the source from which such a supply could be drawn, and the funds available for that purpose. Corporations and individuals were alike anxious to furnish the Asylum in connection with supplying Napa City. Seemingly, advantageous terms were presented by skilled partizans. After mature deliberation, and a proper consideration of many contingencies involved in the life of corporations and individuals, it was deemed for the best interests of the Asylum to avoid the possibilities of all entangling alliances, and the Board resolved that a faithful execution of its trust demanded that so important an adjunct as the water supply should be on no less firm foundation than the walls of the institution itself, and that it were better for the State to own and control its own water supply, even though to do so would cost double what the same supply could be obtained for through the instrumentality of a corporation. Acting upon this theory, the Board, by necessary legal proceedings and by purchase, obtained the riparian rights to the waters of what is known as Spencer Creek, and also the necessary rights of way for conducting the same to the Asylum buildings and grounds. This stream is in a northeasterly direction from the Asylum, and distant a little over

two miles therefrom. It is a living stream, and has a large watershed. The waters are pure, as will be seen from the report of its analysis as presented in the Resident Physician's report. From careful measurements, it will afford in the dry season from fifty thousand to seventy-five thousand gallons of water daily. By the erection of a suitable dam and resorting to catchment, this supply can be easily increased to any daily quantity which the possibilities of the Asylum will require.

After determining upon obtaining these waters, the Board caused the plans, specifications, and drawings for the necessary pipe to be prepared, as required by the Act of March 23d, 1876 (Statutes 1875-6, page 427). After their approval by the proper authorities, public notice was given inviting sealed proposals for the making of the pipe. At the time appointed, two bids were received, one offering to furnish the pipe at 98 cents per lineal foot, and the other at \$1 10 per lineal foot. Satisfied that a combination had been entered into between bidders, both tenders were rejected, and the necessary pipe was subsequently purchased in open market for less than one-half the price fixed by the lowest bid.

The waters of Spencer Creek—its natural flow—have been conducted to the Asylum; and while there is an abundance for all hospital purposes, it is a scant supply for irrigation. To afford the supply for the latter purpose, a dam will have to be erected. A magnificent site is furnished on lands owned by the State, and the conditions for its construction at a comparatively small cost are very favorable. From estimates, now in our possession, made by Mr. H. Schussler, after a full and exhaustive examination of the locality, a dam capable of holding 40,000,000 gallons can be constructed at a cost of about \$25,000. The necessities of the Asylum demand that this should be done at once.

Since the date of our last report, the Asylum has been supplied with coal gas-works. They were erected according to the designs prepared by and under the supervision of Mr. James R. Smedberg, of San Francisco, and are a model of strength and beauty. They are simple in construction, easily operated, and so far have occasioned no trouble, and but a very slight expense. The quality of gas produced is of a very superior illuminating power, being equal to that supposed to be furnished by thirty-two sperm candles. Owing to the density of this rich gas, it does not pass through the pipes as rapidly as would a gas of less specific gravity. For the purpose of illustration we present the following table, showing the amount of gas made and its cost for the fiscal year ending June 30th, 1877:

GAS MADE, AND ITS COST.

MONTH.	Coal Used— Pounds.	Cost of Coal.	Shale Used— Pounds.	Cost of Shale.	Cords of Wood Used.	Cost of Wood.	Lime Used— Barrels.	Cost of Lime.	Number of Feet of Gas Made.	Total Cost.
1878.										
July	4,950	\$29 08	1,220	\$18 54	7	\$56 00	1	2 10	31,160	\$105 72
August	5,966	33 11	1,390	21 12	7	56 00	2	4 20	51,540	114 73
September	7,740	40 73	1,905	28 96	5	40 00	2	4 20	37,840	112 09
October	10,080	55 19	2,320	37 85	4	32 00	3	6 30	67,730	131 34
November	13,040	64 70	3,341	50 78	5	40 00	2	4 20	88,710	159 68
December	13,920	69 10	3,480	44 65	4	32 00	2	4 20	100,870	149 95
1879.										
January	15,360	76 26	3,840	49 72	5	40 00	2	4 20	98,990	170 18
February	11,680	57 99	2,920	37 81	5	40 00	2	4 20	76,010	140 00
March	9,960	49 45	2,390	33 53	6½	52 00	2	4 20	60,960	139 18
April	7,360	36 53	1,840	23 82	6½	52 00	2	4 20	44,988	116 55
May	6,880	32 34	1,720	22 26	7	45 50	2	4 20	41,020	104 30
June	11,080	52 08	1,330	17 22	1	6 50	1	2 10	31,720	77 90
Totals	118,016	\$596 56	28,096	\$386 26	63	\$492 00	23	\$18 30	731,538	\$1,321 62

It thus appears that the cost of this gas of such great illuminating power is but a fraction over two dollars per thousand feet. This is a highly satisfactory result, and a practical solution of a question that has been the source of a great deal of discussion.

From an examination of the Resident Physician's report, it will appear that the article of meats enters largely into the cost of the support of this Asylum. Owing to the fact that the country in which it is situate is but little devoted to stock-raising, this Asylum has not been able to secure its meat contracts on as favorable terms as other public institutions under management of the State. In order to remedy this, we suggest that the Asylum purchase the live stock and do its own slaughtering. To do this successfully, it will be necessary to fence a large body of pasture lands now belonging to the State, properly subdivide the same, erect sheds thereon, and acquire some additional lands. This can be done at a comparatively trifling expense, and in our judgment will prove a good investment. No prudent business man, having the same interests at stake, would fail to do this; and we know of no good reason why the business of the State cannot and should not be conducted upon as thrifty and as economical a basis as can that of a private individual.

It will also appear from an examination of the Resident Physician's report that this Asylum is now, and has been for some time past, affording accommodations to a much larger number of patients than was contemplated in its construction. As the number of persons who are constantly being sent to its shelter far exceeds the number of discharges and deaths, it is becoming a serious problem as to what disposition must be made of these unfortunates in future. The Resident Physician, in his report, makes some suggestions which we heartily second; but assuming that it is not desirable or politic to construct another Asylum at the present time, we respectfully submit some further considerations on this subject. While this Asylum building is a magnificent structure, the beauty of which may be well admired, it is nevertheless true that it cost a great deal of money—so much that there has been considerable dissatisfaction at it on the part of taxpayers. The center portion of this building was designed for and is devoted to the residences of the families of the physicians, and is by far the most costly part. We suggest that residences for the Resident Physician and the Assistant Physicians be erected outside of the Asylum building, and that the quarters now occupied by them be fitted up for the accommodation of patients. Suitable residences can be constructed for from \$5,000 to \$6,000 each, and the apartments now occupied in the center building can be fitted so as to accommodate from seventy to eighty patients at a cost of about \$5,000.

We again renew our suggestion as to the necessity of making an appropriation for the erection of a stable and barn. The building or buildings now used for that purpose are constructed of wood, and are the temporary buildings formerly used by the contractors for the lodging of workmen engaged on the asylum building. It is hardly necessary to dwell upon the dangers to which the property of the State is constantly exposed by the use of buildings of this character. From \$8,000 to \$10,000 will be needed for the construction of the proper buildings.

The report of the Treasurer, herewith submitted, will show the financial condition of the Asylum. The report of the Resident Physician, also herewith submitted, will exhibit the general condition

and system of management of the Asylum. It also contains such suggestions and recommendations as are deemed necessary for the future success and economical management of the institution; and to these we invite your earnest consideration.

On the 19th day of March, 1879, the Board, in pursuance of law, elected Doctor F. W. Hatch, Jr., of Sacramento, Second Assistant Physician. His selection has proved highly satisfactory to the general welfare of the Asylum.

Captain George W. Gift, our Secretary and Treasurer, died at Napa City on the 11th day of February, 1879, and Mr. G. F. Hartwell was elected to fill the vacancy. Captain Gift was no ordinary man, and we here record his death with profound respect for his integrity, with admiration for his brilliant intellect, and with love for his goodness. The State has lost an able, upright, and conscientious public servant.

Respectfully,

F. E. JOHNSTON,
A. G. BOGGS,
P. VON BEVER,
JOHN BOGGS,
GEORGE C. PERKINS,
Trustees.

October 1, 1879.

TREASURER'S REPORT.

To the Honorable Board of Trustees of the Napa State Asylum for the Insane:

GENTLEMEN: Herewith you will find my report as Treasurer, showing the financial condition of the Asylum. It covers the expenditures in the medical department for the two fiscal years immediately preceding the first day of July, 1879, and in the department of construction from the first day of September, 1877, to the first day of October, 1879. Vouchers are in my office for all moneys paid out.

Respectfully,

G. F. HARTWELL, Treasurer.

THE TREASURER IN ACCOUNT WITH THE MAINTENANCE FUND FOR THE FISCAL YEAR ENDING JUNE THIRTIETH, EIGHTEEN HUNDRED AND SEVENTY-EIGHT.

Receipts.

July 1, 1877—To balance on hand as per last biennial report.....	\$8,368 49
September 15, 1877—Received from the State.....	8,666 00
September 15, 1877—Received from Dr. Wilkins.....	458 02
October 1, 1877—Received from the State.....	8,666 00
October 11, 1877—Received from the State.....	8,668 00
October 11, 1877—Received from Dr. Wilkins.....	345 00
November 30, 1877—Received from Dr. Wilkins.....	3,443 20
December 17, 1877—Received from Dr. Wilkins.....	158 10
January 14, 1878—Received from Dr. Wilkins.....	253 13
January 14, 1878—Received from Mellor & Sylvester.....	132 00
February 15, 1878—Received from the State.....	33,000 00
February 15, 1878—Received from Dr. Wilkins.....	225 70
March 18, 1878—Received from the State.....	9,000 00
March 18, 1878—Received from Dr. Wilkins.....	88 90
April 12, 1878—Received from exchange.....	15 00
April 30, 1878—Received from the State.....	9,000 00
April 30, 1878—Received from Dr. Wilkins.....	162 50
May 11, 1878—Received from exchange.....	15 00
May 28, 1878—Received from the State.....	11,000 00
May 13, 1878—Received from Dr. Wilkins.....	226 70
June 17, 1878—Received from Dr. Wilkins.....	158 40
June 30, 1878—Received from Dr. Wilkins.....	252 90
June 30, 1878—Received from the State.....	22,000 00

Total	\$124,303 04
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Expenditures.

Paid out on orders made by the Board of Trustees and entered on their minutes..	\$98,520 20
July 1, 1878—Balance cash on hand.....	25,782 84

Total	\$124,303 04
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THE TREASURER IN ACCOUNT WITH THE MAINTENANCE FUND FOR THE FISCAL YEAR ENDING JUNE THIRTIETH, EIGHTEEN HUNDRED AND SEVENTY-NINE.

Receipts.

July 1, 1878—Balance cash on hand.....	\$25,782 84
August 7, 1878—Received from the State.....	8,000 00
August 12, 1878—Received from Dr. Wilkins.....	199 50
September 13, 1878—Received from Dr. Wilkins.....	3,177 35
October 14, 1878—Received from Dr. Wilkins.....	560 67
November 18, 1878—Received from Dr. Wilkins.....	209 00
December 12, 1878—Received from Dr. Wilkins.....	1,726 25
January 10, 1879—Received from Dr. Wilkins.....	284 87
February 20, 1879—Received from Dr. Wilkins.....	153 65
February 20, 1879—Received from the State.....	8,000 00
March 20, 1879—Received from the State.....	26,000 00
March 20, 1879—Received from Dr. Wilkins.....	168 80
April 21, 1879—Received from the State.....	18,500 00
April 21, 1879—Received from Dr. Wilkins.....	1,684 15
May 12, 1879—Received from Dr. Wilkins.....	172 20
June 12, 1879—Received from the State.....	9,500 00
June 12, 1879—Received from Dr. Wilkins.....	410 60
June 30, 1879—Received from the State.....	19,000 00
June 30, 1879—Received from Dr. Wilkins.....	663 26
June 30, 1879—Received from Dr. Wilkins.....	1,809 46
June 30, 1879—Received from the State.....	19,000 00
Total	<u>\$145,002 60</u>

Expenditures.

Paid out on orders of the Board entered on their minutes.....	\$114,482 62
July 1, 1879—Balance cash on hand.....	30,519 98
Total	<u>\$145,002 60</u>

THE TREASURER IN ACCOUNT WITH THE CONSTRUCTION FUND FROM SEPTEMBER FIRST, EIGHTEEN HUNDRED AND SEVENTY-SEVEN, TO OCTOBER FIRST, EIGHTEEN HUNDRED AND SEVENTY-NINE.

Receipts.

September 1, 1877—Balance cash on hand, as per last biennial report.....	\$2,096 11
February 15, 1878—Received from the State.....	10,000 00
August 7, 1878—Received from the State.....	36,751 40
Total	<u>\$48,847 51</u>

Expenditures.

Paid out on orders of the Board entered in their minutes.....	\$48,648 36
October 1—Balance cash on hand.....	199 15
Total	<u>\$48,847 51</u>

THE TREASURER IN ACCOUNT WITH THE DEFICIENCY FUND FOR THE FISCAL YEAR ENDING JUNE THIRTIETH, EIGHTEEN HUNDRED AND SEVENTY-SIX.

Receipts.

April 29, 1878—Received from the State.....	<u>\$13,420 00</u>
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Expenditures.

April 29, 1878—Paid out on orders of the Board entered on their minutes.....	\$13,420 00
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G. F. HARTWELL, Treasurer.

RESIDENT PHYSICIAN'S REPORT

To the Board of Trustees of the Napa State Asylum for the Insane:

GENTLEMEN: I hereby submit to you my annual report for the year ending with June 30th, 1878.

ANNUAL SUMMARY.

The following summary exhibits the number of patients in the Asylum July 1st, 1877, number admitted, number under care and treatment, number discharged recovered, number discharged improved, number discharged unimproved, number discharged not insane, and the number of deaths and elopements during the year ending with June 30th, 1878, and the number remaining in the Asylum July 1st, 1878:

ANNUAL SUMMARY.

FROM JUNE 30TH, 1878, TO JULY 1ST, 1879.	Males.	Females.	Totals.
Number of patients July 1st, 1877-----	247	148	395
Number admitted during the year*-----	286	147	433
Number under care and treatment -----	533	295	828
Number discharged recovered-----	104	44	148
Number discharged improved-----	21	13	34
Number discharged unimproved-----	10	10	20
Number discharged not insane-----	10	7	17
Number died-----	53	17	70
Number eloped-----	11	-----	11
Discharged, died, and eloped-----	209	91	300
Number of patients remaining July 1st, 1878-----	324	204	528

*Of the number admitted during the year ten had been in this Asylum, nineteen had been in the Asylum at Stockton, two had been in this and the Asylum at Stockton, and seven had been in other Asylums.

TABLE I.

Showing the counties from which four hundred and thirty-three patients were admitted, from July 1st, 1877, to July 1st, 1878.

COUNTIES.	Males.	Females.	Totals.
Alameda-----	25	12	37
Amador-----	1	-----	1
Butte-----	-----	1	1
Colusa-----	8	1	9
Contra Costa-----	3	1	4
El Dorado-----	-----	1	1
Humboldt-----	10	1	11
Lake-----	1	-----	1
Los Angeles-----	10	12	22
Carried forward-----	58	29	87

TABLE I—Continued.

COUNTIES.	Males.	Females.	Totals.
Brought forward	58	29	87
Marin	8	1	9
Mendocino	1	1	2
Modoc	2	—	2
Monterey	1	—	1
Napa	8	4	12
Nevada	2	2	4
Placer	—	1	1
Sacramento	4	—	4
San Benito	—	1	1
San Diego	2	3	5
San Francisco	146	86	232
San Luis Obispo	6	2	8
San Mateo	4	1	5
Santa Clara	—	2	2
Siskiyou	3	—	3
Solano	11	4	15
Sonoma	13	6	19
Sutter	2	2	4
Tehama	1	1	2
Tuolumne	1	—	1
Ventura	4	—	4
Yolo	7	1	8
Yuba	2	—	2
Totals	286	147	433

TABLE II.

Showing the nativity of four hundred and thirty-three patients admitted, from July 1st, 1877, to July 1st, 1878.

NATIVITY.	Males.	Females.	Totals.
<i>United States.</i>			
Alabama	1	—	1
California	9	11	20
Connecticut	1	1	2
Delaware	—	1	1
Illinois	3	2	5
Indiana	2	—	2
Iowa	1	—	1
Kentucky	2	4	6
Louisiana	2	—	2
Maine	6	4	10
Maryland	3	—	3
Massachusetts	7	6	13
Michigan	1	—	1
Mississippi	1	—	1
Missouri	5	2	7
New Jersey	3	—	3
New Hampshire	1	—	1
New York	35	13	48
North Carolina	—	1	1
Ohio	5	5	10
Pennsylvania	9	5	14
Rhode Island	2	—	2
South Carolina	2	1	3
Tennessee	2	—	2
Texas	1	—	1
Carried forward	104	56	160

TABLE II—Continued.

NATIVITY.	Males.	Females.	Totals.
Brought forward	104	56	160
United States		3	3
Vermont	3		3
Virginia	2	2	2
Wisconsin	1	1	4
Totals	110	62	172
<i>Foreign Countries.</i>			
Australia	1		1
Austria	3		3
Bavaria	1		1
Belgium	1		1
Canada	6	3	9
China	7	1	8
Costa Rica	1		1
Denmark	4	2	6
England	17	5	22
France	11	2	13
Germany	28	12	40
Holland	1		1
Ireland	54	43	97
Italy	10	1	11
Mexico	7	4	11
New Brunswick	2	1	3
New Guinea	1		1
Norway	2		2
Panama		1	1
Peru		1	1
Poland	2		2
Prussia	2		2
Russia		1	1
Scotland	6	4	10
Sweden	2	2	4
Switzerland	4		4
Unknown	1		1
Wales		2	2
Western Islands	1		1
Totals	175	85	260
<i>Territories.</i>			
Utah	1		1

RECAPITULATION.

NATIVITY.	Males.	Females.	Totals.
United States	110	62	172
Foreign countries	174	85	259
Territories	1		1
Unknown	1		1
Totals	286	147	433

TABLE III.

Showing the ages of four hundred and thirty-three patients at the time of their admission in the Asylum, from July 1st, 1877, to July 1st, 1878.

AGES.	Males.	Females.	Totals.
Between 10 and 20 years	18	7	25
Between 20 and 30 years	63	38	101
Between 30 and 40 years	88	45	133
Between 40 and 50 years	58	36	94
Between 50 and 60 years	36	13	49
Between 60 and 70 years	14	5	19
Between 70 and 80 years	6	2	8
Unknown	3	1	4
Totals	286	147	433

TABLE IV.

Showing the supposed cause of insanity in four hundred and thirty-three patients, as stated in commitments, from July 1st, 1877, to July 1st, 1878.

SUPPOSED CAUSES.	Males.	Females.	Totals.
Anxiety	1	—	1
Apoplexy	1	—	1
Business troubles	8	—	8
Cerebral meningitis	2	1	3
Change of life	—	4	4
Child-birth	—	10	10
Death of child	1	4	5
Death of husband	2	2	2
Derangement of womb	—	1	1
Disappointment	1	—	1
Disappointment in love	1	2	3
Domestic trouble	5	10	15
Epilepsy	14	2	16
Fear of poverty	—	1	1
Grief	—	3	3
Growth of tumor	1	—	1
Hereditary	8	10	18
Injury from fall	1	—	1
Injury to head	7	3	10
Injury to spine	—	1	1
Ill health	5	3	8
Intemperance	25	4	29
Jealousy	—	1	1
Lactation	—	3	3
Loss in mining stocks	2	—	2
Loss of property	3	—	3
Loss of a son	1	—	1
Masturbation	28	—	28
Nursing child	—	2	2
Old age	2	3	5
Overwork	—	1	1
Paralysis	4	—	4
Pregnancy	—	2	2
Puerperal condition	—	1	1
Religion	2	4	6
Softening of brain	1	—	1
Spiritualism	2	3	5
Sunstroke	3	—	3
Suppressed menstruation	—	3	3
Syphilis	4	—	4
Carried forward	133	84	217

TABLE IV—Continued.

SUPPOSED CAUSES.	Males.	Females.	Totals.
Brought forward	133	84	217
Tuberculosis	1	1	1
Typhoid fever	1	1	1
Unknown	146	59	205
Use of opium	3	1	4
Use of tobacco	1	1	1
Uterine irritation	1	3	3
Want of employment	1	1	1
Totals	286	147	433

TABLE V.

Showing the class of insanity of four hundred and thirty-three patients, at the time of admission, from July 1st, 1877, to July 1st, 1878.

CLASS.	Males.	Females.	Totals.
Dementia	29	12	41
Idiocy	1	1	1
Kleptomania	1	1	1
Mania	156	87	243
Melancholia	16	13	29
Monomania	31	17	48
Puerperal mania	1	10	10
Unknown	52	8	60
Totals	286	147	433

TABLE VI.

Showing the civil condition of four hundred and thirty-three patients admitted from July 1st, 1877, to July 1st, 1878.

CIVIL CONDITION.	Males.	Females.	Totals.
Married	83	89	172
Single	178	35	213
Widows	1	20	20
Widowers	11	1	11
Unknown	14	3	17
Totals	286	147	433

TABLE VII.

Showing the occupation of four hundred and thirty-three patients, admitted from July 1st, 1877, to July 1st, 1878.

OCCUPATION.	Males.	Females.	Totals.
Actor	1		1
Advertising solicitor	1		1
Artist	1		1
Baker	1		1
Barbers	2		2
Bar-keepers	2		2
Boiler-maker	1		1
Blacksmiths	3		3
Book agent		1	1
Book-keepers	3		3
Box-maker	1		1
Brewer	1		1
Butchers	3		3
Candy-maker	1		1
Capitalist	1		1
Cabinet-maker	1		1
Car conductor	1		1
Carpenters	18		18
Cigar-makers	2		2
Clerks	12		12
Convicts	3		3
Cooks	6		6
Correspondent	1		1
Domestics		15	15
Dressmaker		1	1
Drayman	1		1
Druggist	1		1
Farmers	19		19
Fringe-maker	1		1
Gardeners	3		3
Harness-maker	1		1
Horse-trainer	1		1
Hotel-keepers	4		4
Housewives		89	89
Iron moulder	1		1
Jewelers	2		2
Laborers	66		66
Laundryman	1		1
Lawyers	2		2
Livery stable-keeper	1		1
Longshoreman	1		1
Lumberman	1		1
Machinists	6		6
Manufacturer	1		1
Merchants	7		7
Miller	1		1
Milliners		2	2
Miners	8		8
Minister	1		1
News boys	2		2
No occupation	22	23	45
Nurses		2	2
Painters	7		7
Phonographer	1		1
Peddlers	4		4
Physician	1		1
Piano tuner	1		1
Porters	3		3
Printers	3		3
Real estate agent	1		1
Saddler	1		1
Sailors	13		13
Carried forward	255	133	388

TABLE VII—Continued.

OCCUPATION.	Males.	Females.	Totals.
Brought forward	255	133	388
Salesman	1	—	1
Sea Captain	1	—	1
Seamstresses	—	2	2
School teacher	—	1	1
Servants	2	9	11
Sheep-herders	2	—	2
Ship-caulker	2	—	2
Shoemakers	3	—	3
Soldiers	2	—	2
Speculators	3	—	3
Stone-cutters	2	—	2
Surveyor	1	—	1
Tailor	1	—	1
Tailoress	—	1	1
Teacher	1	—	1
Teamster	1	—	1
Tinsmith	1	—	1
Unknown	7	—	7
Washerwoman	—	1	1
Wheelwright	1	—	1
Totals	286	147	433

TABLE VIII.

Showing the cause of death of seventy patients from July 1st, 1877, to July 1st, 1878.

Month.	CAUSE OF DEATH.	Nativity.	Age.	Males	Females
July, 1877	Congestion of the brain	Ireland	37	—	1
July, 1877	Paralysis	New York	50	1	—
July, 1877	Pleuro-pneumonia	Unknown	40	1	—
August, 1877	Typhoid-pneumonia	New York	31	1	—
August, 1877	General debility	New York	73	1	—
August, 1877	Maniacal exhaustion	New Jersey	38	1	—
August, 1877	Organic disease of brain	Ireland	40	—	1
August, 1877	Cerebral meningitis	New Zealand	30	1	—
August, 1877	Cerebral Paralysis	England	40	1	—
September, 1877	General debility	China	Unknown	—	1
September, 1877	General paralysis	Germany	45	1	—
September, 1877	Apoplexy	Vermont	64	1	—
September, 1877	Consumption	New York	39	1	—
September, 1877	Consumption	New Jersey	58	1	—
October, 1877	Exhaustion	Mexico	68	1	—
October, 1877	Exhaustion	England	59	1	—
October, 1877	Typhoid fever	Ohio	34	1	—
October, 1877	Exhaustion	China	25	1	—
October, 1877	Exhaustion	Ireland	60	1	—
October, 1877	Marasmus	Poland	65	1	—
October, 1877	Marasmus	Mexico	40	—	1
November, 1877	General paralysis	France	36	1	—
November, 1877	Consumption	New York	52	1	—
November, 1877	Dropsy	Ireland	55	1	—
November, 1877	Cerebral meningitis	Virginia	57	1	—
November, 1877	Pneumonia	Costa Rica	49	1	—
November, 1877	General paralysis	New York	45	—	1
November, 1877	Old age	Scotland	75	—	1

TABLE VIII—Continued.

Month.	CAUSE OF DEATH.	Nativity.	Age.	Males	Females
December, 1877.	Septicæmia	Scotland	37	1	—
December, 1877.	Consumption	Wales	40	—	1
December, 1877.	Dropsy	Ireland	40	1	—
December, 1877.	Congestion of the lungs	China	40	1	—
December, 1877.	Old age	France	72	1	—
January, 1878.	General debility	Ohio	65	1	—
January, 1878.	General debility	New York	56	1	—
January, 1878.	Septicæmia	Illinois	37	1	—
January, 1878.	Exhaustion	West India Isles	65	—	1
January, 1878.	Embolism of the heart	Kentucky	20	—	1
January, 1878.	Erysipelas	Kentucky	71	—	1
February, 1878.	Old age	Vermont	77	1	—
February, 1878.	Consumption	Illinois	45	1	—
February, 1878.	Organic disease of brain	Germany	50	1	—
February, 1878.	Organic disease of brain	China	Unknown	1	—
February, 1878.	Old age	Massachusetts	78	—	1
February, 1878.	Organic disease of brain	Mexico	57	1	—
March, 1878.	Dropsy	Chili	40	—	1
March, 1878.	Organic disease of brain	Illinois	36	1	—
March, 1878.	Paralysis	Pennsylvania	46	1	—
March, 1878.	Suicide	Switzerland	36	1	—
March, 1878.	Old age	Canada	70	—	1
March, 1878.	Paralysis	Scotland	37	1	—
March, 1878.	Peritonitis	California	16	—	1
March, 1878.	General debility	England	58	1	—
April, 1878.	Exhaustion	England	30	1	—
April, 1878.	Consumption	Kentucky	37	1	—
April, 1878.	Paralysis	Virginia	60	1	—
April, 1878.	Maniacal exhaustion	Louisiana	35	1	—
April, 1878.	Paralysis	Indian Territory	55	1	—
May, 1878.	Maniacal exhaustion	Scotland	40	1	—
May, 1878.	Septicæmia	Ireland	32	1	—
May, 1878.	Consumption	Ireland	26	—	1
May, 1878.	Epilepsy	California	21	1	—
May, 1878.	Exhaustion	Canada	35	1	—
May, 1878.	Apoplexy	New Brunswick	59	1	—
May, 1878.	Paralysis	France	47	1	—
June, 1878.	Paralysis	New York	37	—	1
June, 1878.	Paralysis	Ireland	35	1	—
June, 1878.	Puerperal fever	Italy	32	—	1
June, 1878.	Consumption	Canada	29	1	—
June, 1878.	Epilepsy	California	8	1	—

TABLE IX.

Recapitulation of the cause of death of seventy patients, from July 1st, 1877, to July 1st, 1878

CAUSE OF DEATH.	Males.	Females.	Totals.
Consumption	6	2	8
Maniacal exhaustion	3	—	3
Exhaustion	6	1	7
Organic disease of brain	4	1	5
Paralysis	8	2	10
All other causes	26	11	37
Totals	53	17	70

TABLE X.

Showing the number of articles made in the sewing-room from July 1st, 1877, to July 1st, 1878.

ARTICLES.	Number.
Tapestry carpets.....	1
Three-ply carpets.....	2
Carpet mats.....	86
Bed ticks.....	136
Pillow ticks.....	122
White sheets.....	47
Brown sheets.....	624
Pillow slips, white.....	465
Pillow shams, pairs.....	1
Damask table-cloths.....	3
Linen table-cloths.....	54
Roller towels.....	104
Bath towels.....	73
Calico dresses.....	93
Cheek dresses.....	68
Basques.....	3
Aprons.....	149
Cotton skirts.....	23
Flannel skirts.....	130
Night gowns.....	59
Chemises.....	111
Drawers, pairs.....	59
Waists.....	22
Neck handkerchiefs.....	9
Collars.....	36
Cuffs, pairs.....	44
Baby slips.....	5
Bibs.....	4
Cotton shirts.....	24
Flannel shirts.....	36
Boys' jackets.....	2
Duck jackets.....	28
Duck pants.....	2
Duck coat.....	1
Duck cap.....	1
Duck bed quilt.....	1
Woolen coats.....	2
Woolen pants, pairs.....	2
Suspenders, pairs.....	32

TABLE FIRST.

Steward's account of articles consumed and purchased, and other expenses, for the fiscal year ending June 30th, 1878.

ARTICLES.	Value.
Flour	\$5,920 26
Meat	7,926 32
Sugar	1,935 98
Tea	391 55
Syrup	963 17
Potatoes	1,717 08
Butter	3,506 26
Coffee	947 85
Lard	107 47
Fish	191 50
Poultry and eggs	381 08
Beans and peas	542 76
Rice, cracked wheat, and oatmeal	326 67
Corn meal and middlings	283 98
Fruit	363 48
Vegetables	13 30
Salt	55 85
Vinegar	74 12
Small groceries	444 16
Soap	686 15
Drugs	784 59
Liquor and ale	369 00
Tobacco	604 48
Dry goods	1,847 35
Clothing and hats	1,446 99
Shoes and leather	714 54
Blankets	1,495 15
Furniture and crockery	1,807 69
Hardware and tinware	1,162 67
Spoons and cutlery	218 95
Carpeting	591 55
Hay and straw	98 34
Grain and feed	608 21
Garden tools and seeds	23 02
Lumber	481 99
Repairs	327 30
Brooms and brushes	350 39
Books and stationery	673 35
Oil and glass	862 36
Fuel	10,158 71
Bedding	1,095 00
Miscellaneous	1,032 94
Feathers	215 80
Discharged patients	634 65
Horses and cattle	410 00
Returned escapes	307 75
Wagons	300 00
Musical instruments	300 00
Interest and exchange	179 92
Gas	377 39
Pay-roll	41,768 12
Total	\$98,027 19

TABLE SECOND.

Showing the cost of the different departments for the fiscal year ending June 30th, 1878.

DEPARTMENTS.	Cost.
Kitchen and dining-rooms -----	\$20,361 35
Wards -----	5,511 94
Bakery -----	5,955 93
Laundry -----	470 58
Engineer's department -----	177 06
Farm, garden, dairy, and stable -----	1,757 88
Building material and repairs -----	1,359 23
Miscellaneous -----	506 23
Drug store -----	921 76
Furnishing -----	6,249 87
Office -----	853 02
Fuel -----	10,158 71
Discharged patients and returned escapes -----	942 75
Center building -----	475 45
Interest and exchange -----	179 92
Gas -----	377 39
Pay-roll -----	41,768 12
Total -----	\$98,027 19

TABLE THIRD.

Averages for the year ending June 30th, 1878.

MONTHS.	Average Number of Patients on Hand Daily	Average Daily Expenses	Average Cost per Capita per Day (Cents)	Average Cost per Capita per Month
July, 1877 -----	398	\$228 04	57	\$17 10
August, 1877 -----	405	218 66	54	16 20
September, 1877 -----	416	236 75	57	17 10
October, 1877 -----	428	240 52	56	16 80
November, 1877 -----	438	259 80	59	17 70
December, 1877 -----	461	261 90	57	17 10
January, 1878 -----	468	261 51	56	16 80
February, 1878 -----	472	276 40	59	17 70
March, 1878 -----	475	266 41	56	16 80
April, 1878 -----	483	268 00	56	16 80
May, 1878 -----	494	236 00	48	14 40
June, 1878 -----	513	241 63	47	14 10
Yearly averages -----	454½	\$249 63½	55½	\$16 55

TABLE FOURTH.

Products of the farm, garden, and dairy, for the fiscal year ending June 30th, 1878.

ARTICLES.	Amount.
Cabbage, pounds	50,393
Beets, pounds	14,547
Green peas, pounds	1,255
Onions, pounds	1,813
Lettuce, pounds	1,134
String beans, pounds	1,455
Turnips, pounds	6,180
Carrots, pounds	1,368
Cucumbers, pounds	4,766
Cauliflower, pounds	84
Tomatoes, pounds	4,850
Eggs, dozens	1,280
Chickens, dozens	13
Green corn, dozens	875
Pumpkins	263
Milk, gallons	10,422
Hay, tons	100

To the Board of Trustees:

GENTLEMEN: Under the provisions of law it again becomes my duty to submit to you my annual report of the management of this Asylum, monthly reports having been regularly submitted for your information and approval. And the report for the year ending June 30th, 1878, having been submitted to you at the July meeting of that year, a copy of which is hereto annexed, it only remains necessary to call your attention to the general transactions of the Asylum for the fiscal year ending June 30th, 1879, and to make such suggestions and recommendations as are deemed necessary for its successful management in the future.

The following summary exhibits the number of patients in the Asylum July 1st, 1878, number admitted, number under care and treatment, number recovered and discharged, number discharged improved, number discharged unimproved, number discharged not insane, and the number of deaths and elopements during the year ending with June 30th, 1879:

FROM JUNE 30TH, 1878, TO JULY 1ST, 1879.	Males.	Females.	Totals.
Number of patients July 1st, 1878.....	324	204	528
Number admitted during the year ending June 30th, 1879*.....	445	170	615
Number under care and treatment.....	769	374	1,143
Number discharged recovered	142	42	184
Number discharged improved	60	37	97
Number discharged unimproved	13	4	17
Number discharged not insane.....	16	3	19
Number died	80	24	104
Number eloped	8		8
Discharged, died, and eloped	319	110	429
Number remaining July 1st, 1879	450	264	714

*Of the number admitted during the year, 47 had been in this Asylum, 31 in the Asylum at Stockton, 7 in both this and the Stockton Asylums, and 11 had been in other Asylums.

This summary presents facts of deep significance and great interest to the people of this State. It is appalling to know that in the short space of three years and a half the accumulation of 714 insane persons in one Asylum should be possible from so small a population as that which furnished them. Estimating the population of the State at 900,000, and assuming that not less than 185 have been committed to the Stockton Asylum, which, added to the 615 received here, would show the unprecedented product of nearly one insane patient for every 1,000 persons in one year. It also reveals the fact that nearly one-third of those committed during the year were still in the Asylum at its close. The percentage of recoveries (29.91) is less than that of the preceding year, while the number discharged as improved (97) is much greater. Many of these might, and in some Asylums doubtless would, have been discharged as recovered, but as nothing could be gained by this, except, perhaps, some addition to my own reputation, I have preferred to adopt the more conservative course, and therefore place none on the list as recovered unless, in my judgment, the cure seems permanent. Of the 615 patients committed during the year, 47 had at some previous time been in this Asylum, mostly from those discharged as improved, 31 had been in the Asylum at Stockton, 7 in both this and the Stockton Asylums, and 11 in other Asylums. These 96 persons belong either to the class of recurrent mania, or that of chronic insanity, of a mild and harmless character, and will in all probability vibrate between the outer world and some Asylum till death puts an end to existence. Those discharged as not insane (19) were either drunkards, temporarily maddened from the effects of alcohol, or criminals seeking and obtaining pardon through the cunningly constructed portals of feigned insanity. As I did not believe them to be insane I could not discharge them as recovered. The number eloped and not returned were 8. I am glad they have been able to take care of themselves. One hundred and four have died—80 men and 24 women—or 8.22 per cent.; a very small percentage indeed, when the causes of death are taken into consideration, as will be seen by an examination of Table IX, in which a recapitulation of the causes of death is exhibited. General paresis, paralysis, and consumption were the causes of death in 42 cases, being 40 per cent. of the whole number, while 6 succumbed to accumulated years. One man died of consumption within 8 hours after his admission, 1 within 5 days, and still another within a week from the same disease, while sundry old hospital cases have not lived out a month. These cases should not be sent to an Asylum for the Insane, as they can only add to the list of insanity in the State, the death rate of the Asylum, and occupy space which is greatly needed for the proper care and comfort of the excited maniac, the dangerous lunatic, the determined suicide, and the depressed melancholic. The idiotic, the imbecile, and harmless persons of feeble minds are still committed in violation of law, and probably will be until some suitable place is provided for their reception. These classes differ from the old hospital cases only in this, they occupy rooms in the Asylum for years, while the others live but a short time. It is very clear to my mind that either a place should be provided for their care and maintenance, or arrangements made for the construction of another Asylum for the Insane, as it is very certain the present accommodations cannot long supply the pressing

demands of the constantly increasing numbers committed to our care.

Even now the male wards of this asylum are crowded to such an extent that proper classification is no longer possible. Of the 165 single rooms in the male wards 100 contain two patients each, leaving but 65 single rooms for the most excited and dangerous. In one instance already a patient has taken the life of his room-mate, and no man is wise enough to know when other calamities of a similar character may take place. There is at least a constant dread upon the minds of those who are held responsible for their proper care and comfort. In other States, when the asylums are overcrowded, the officers are invested with authority to refuse the reception of all but acute cases, while here the troublesome child below the teens, or the old man in his dotage, can be sent to our crowded wards without let or hindrance. It surely must be palpable, even to those who have paid no attention to the treatment of the insane, that where the brain or its membranes are diseased, when the sensitive nervous system is in a state of excitement, that sleep and quietude are absolutely necessary to the reëstablishment of physical health and mental integrity. But this cannot be done, in most cases, where two such patients occupy the same room, as the groans and restless complaints of the one must disturb and excite the other. Yet such is the condition of this Asylum to-day, and though the attic in the center building is being rapidly pushed to completion for the accommodation of fifty quiet patients, the relief will only be temporary.

In view of the foregoing facts, I therefore respectfully suggest that your Honorable Board earnestly urge upon Governor Irwin, Governor-elect Perkins, and the next Legislature, the paramount importance, if not the absolute necessity, of making an appropriation sufficient to fit up the attics over the laundry building and store-room, and the rooms in the rear of the amusement hall, for the occupation of patients. These three wards would afford accommodations for one hundred and fifty quiet patients. There are in every hospital a proportion of the patients enfeebled by disease or old age, who cannot go into the airing-courts with the rest on damp or chilly days, but who require a higher degree of temperature to render them comfortable than is necessary for the more vigorous and robust. They also need special diet, served in a warmer and more tempting form than can be done from the general kitchen for the tables of the wards. But owing to the construction of this Asylum, and the method of heating the wards, the sitting rooms, which are mere recesses in the halls, cannot be heated separately from the wards; nor is there any provision made for preparing "sick diet" in the wards. It is therefore often necessary to heat an entire ward, at great expense, for the benefit of the few; and even then, when it becomes necessary to ventilate the wards, no portion of them can be kept warm on a cold day while the windows are open. I therefore feel the necessity of an infirmary for each sex, in accordance with the original design of this hospital, say for twenty-five patients each, and earnestly recommend their construction. These infirmaries, together with the attics referred to above, would afford accommodations for two hundred additional patients at a cost, in my opinion, not exceeding \$60,000. And in no other way can an equal number be provided for at so small a cost.

A barn for the storage of hay and straw, and for the protection of

our horses, cows, wagons, and farming implements is greatly needed, and I am confident that every practical farmer in the Legislature will recognize the importance of this suggestion, and will cheerfully vote for a sufficient appropriation for its construction.

The amount of work done on the grounds in grading, laying out, constructing and graveling roads and walks, constructing culverts, planting trees, shrubs, and hedges, and in adorning and beautifying the place has been greater than any one would imagine who has not witnessed its progress. But you who have seen the progress made month by month, can fully appreciate what has been accomplished, and know what remains to be done. While I am duly thankful to the Board for the liberal assistance rendered in accomplishing this work, it is due to the patients who have assisted to say that the greater part of the labor has been done by them.

This work still goes bravely on, and with your encouragement, their labor, and a moderate appropriation by the Legislature, I hope ere long the grounds of this Asylum will be the most beautiful and attractive of any belonging to the State. A small appropriation of \$1,200 per annum, to employ a landscape gardener and the purchase of shrubs and flowers, will be sufficient for this purpose, as the patients can do the work, while benefiting themselves.

The beneficial effects of pleasant surroundings upon the minds of insane persons are quite as great as upon those who are sane, and cannot be overestimated. Every moment occupied in viewing with pleasurable emotions the beauty of the surroundings, the growth of a tree, or the sweetness of a flower, is a diversion of the mind from the sad condition of the patient, and has a tendency to reëstablish a condition of health and cheerfulness.

When the main avenue is finished and opened for use, it will be necessary to build a lodge for the Gate-keeper, as it will be too far from the Asylum to prevent depredations by stock passing upon the public highway. A trusty patient can always be found to act as Gate-keeper, and occupy the lodge.

Since the water supply from Spencer Creek was brought upon the grounds, on the 16th of May, 1879, we have had the greatest abundance for the use of the hospital, and some 30,000 gallons per day for irrigating purposes. The great advantages to be derived from an abundant supply of water cannot be overestimated. It is alike necessary to safety, cleanliness, and comfort, to say nothing of its importance in beautifying the grounds. Of course we could use to advantage a much greater quantity than our present supply, and hope at some future time a reservoir will be constructed upon the Spencer tract, now the property of the State.

It affords me pleasure to state that an analysis of the water, made by Henry G. Hanks, chemist, San Francisco, at the request of Doctor F. W. Hatch, Secretary of the State Board of Health, is of a most satisfactory character. It is submitted for your information.

Mr. Hanks, the chemist, says:

I find this water to be remarkably free from impurities, as the following statement will show: The water is transparent, free from color, containing but a small quantity of suspended matter, which quickly subsides when the water is allowed to stand; it is very slightly alkaline, and a portion of the fixed ingredients is in the state of bicarbonates.

A microscopic examination shows the suspended matter to be principally vegetable, and the forms revealed are those common in good water when it is allowed to stand for a time in reservoirs or tanks.

The total fixed constituents in this water were found to be 11.08 grains in one United States wine gallon, which is equal to 13.3 grains in one Imperial gallon, 0.190 grammes to the litre, and to 19.0 parts in 100.000.

The hardness is equal to 3.7 grains of carbonate of lime in an Imperial gallon, or 5.29 parts in 100.000. From organic matter, both in the form of ammonia and albuminoid matter, it is singularly free, showing only traces.

The constituents found, and which it was thought necessary to determine quantitatively, are as follows: Carbonic acid, chlorine, phosphoric acid (trace), boracic acid (trace), iron, lime, silica, soda, and magnesia.

As the result of my examination I have no hesitation in pronouncing this water to be good and in every way fitted for domestic use. It is remarkably soft, free from sulphate of lime, contains only a small quantity of fixed ingredients, and is free from mechanical impurities, which properties render it in every way suitable for manufacturing purposes.

[SEAL.]

HENRY G. HANKS.

The result of this analysis is particularly gratifying to me, since, soon after the introduction of the water from Spencer Creek, more than the usual number of cases of diarrhœa was observed among the patients, and I had some apprehension that the cause might be found in the use of this water. This being removed, I now have some fears that the sewerage of the Asylum is in some way defective, but as yet have been unable to discover in what particular respect. I am still investigating the matter, and, if my fears are well founded, hope to be able to discover and remedy the defects.

As every room in the Asylum has a window communicating with the outside air, an abundance of this health-preserving element can at all times be admitted to the wards. The ventilation of the water-closets, however, is by no means satisfactory. The metallic flues, or pipes connecting them with the smoke-stack of the boiler-house, for the purpose of producing a downward draught, seem, in a great measure, to have failed to accomplish the purpose for which they were intended. Whether the defect lies in the connection of the flues, in their construction or arrangement, I have been unable to determine as yet; nor has any provision been made to carry off the foul air from the water-closets by means of flues, a very great defect which should, if possible, be remedied. In this connection I will also call your attention to the necessity of laying a pipe from the mouth of the main sewer to some point beyond the public road leading from Napa City to Vallejo. The odors arising from the sewerage now conducted in an open ditch from the mouth of the sewer are offensive to travelers along the highway, and might in time produce disease among the inmates of the Asylum. A small appropriation will be required for this purpose.

The fences of the farm and grounds are in the main those that were purchased with the tract of land, and are unfit for a decent farm, much less the lands of a State institution. At least two miles of good and substantial fences should be made upon the Asylum tract at an early day.

An appropriation should also be made for the reclamation of the low lands between the high land and the line of the railroad; when reclaimed it will be invaluable for raising alfalfa hay, and for the fall pasture of our dairy cows.

The construction of the new drying-room was an absolute necessity, without which it would have been impossible to dry the clothes of 800 people in the winter months.

The walls in many of the wards, especially those for untidy patients, are greatly in need of a coat or two of paint. The first time they are

painted the expense should be charged to the account of an Improvement Fund, afterwards to the account of ordinary repairs, which is derived from the Maintenance Fund.

By an examination of the recapitulation of Table II, showing the nativity of 615 patients, admitted to the Asylum during the year, it will be seen that two-thirds were of foreign birth. This is in accordance with the previous experience of this Asylum, and also of the Asylum at Stockton. It is a frightful fact to be contemplated by our foreign-born citizens and residents, and should cause them to avoid, as far as practicable, the too sudden changes of the habits of life, and mode of living, to which they were accustomed in their native lands. A given number of foreign-born persons will furnish four times as many cases of insanity as that furnished by the same number of those born in the United States. While there may be many causes producing this result, those to which I have alluded are doubtless by far the most potent.

The sudden change from a diet consisting mostly of vegetable substances, to one in which animal food largely enters, must necessarily change the character and quality of the blood, rendering it richer in fibrin and more stimulating in its nature. The brain and nervous system, with their surrounding membranes, being unaccustomed to the stimulus which this richer blood supplies, yields to inflammations and congestions, whether active or passive, acute or chronic, until at last, in too many cases, derangement of the intellectual faculties ensues. Those who are at all familiar with the character of the persons of foreign birth who fill our asylums and crowd our wards, are aware of the fact that they mostly belong to the poor and uneducated ranks of society. At home they were comparatively free from many of the exciting causes that are so prolific in producing insanity in this country. In all probability, when in their native lands, they retired at regular hours, slept quietly during the night, undisturbed by the dreams of what the changes of the morrow might bring forth; rose at a regular hour in the morning, partook of a wholesome meal of unstimulating food, and performed a regular day's work. Dissipation was necessarily impracticable, since places were not easily found after one had been lost from neglect of duty; and the demands of the family for support was too great to be risked by a drunk. Here these conditions are all changed. Labor is easily obtained, wages good, eating animal food the custom of the people, and whisky cheap. It is not surprising then, that excessive indulgence in these habits and temptations should in many cases lead to the dethronement of reason. Let me say to these people then, be prudent, be temperate, and you will be sane. In this connection I will again call your attention to the fact that nearly twenty per cent. of the inmates of this Asylum are not citizens of the United States, but owe allegiance to other countries. It is unjust that these persons should be maintained by the taxpayers of California, and the manner with which this subject should be dealt is worthy of your earnest consideration. It has been a question, in my mind, whether it would not be true economy, in many cases, for the State to defray the expenses of sending them to the governments to which their allegiance is due.

The patients are subjected, as heretofore, to medical, moral, and hygienic treatment; such remedies are prescribed as the condition of each case would seem to require—cathartics, tonics, alteratives, seda-

tives, hypnotics, or other remedies indicated by the symptoms present. No routine practice is pursued, while constant attention to the general health is never lost sight of, since upon a healthy condition of the physical system mental integrity depends.

The moral treatment consists in kind and encouraging words, in gaining the confidence and esteem of the patients in every possible manner—as gentle treatment as the nature of each case will permit—always giving assurance that no restriction is placed upon the actions of any as a matter of punishment; constant efforts to promote harmony and establish good feeling and friendly relations between the patients themselves and all those who come in contact with them, whether as officers, employés, or attendants; such diversions, occupation, or amusements as can be provided for their benefit, the holding of service in the chapel when the ministry can spare the time from their own congregations to divide the Sabbath with us, which many of the patients look forward to with great satisfaction. Music, dancing, and reading are also adjuncts to this treatment, the weekly dance being especially enjoyed by them. Two bands of music have been organized among the attendants and employés, for which they deserve great credit, and from which much pleasure is derived by all. But we need more books and periodicals to be read by the patients, and more pictures for distribution among the wards. We also need a piano, to be placed in the amusement hall, to be used on occasions of entertainments. A magic lantern would also be an important adjunct. One thousand dollars expended in this direction, I think, would be a judicious investment, and would reap its reward.

The hygienic treatment consists in paying attention to the diet and the cleanliness of the patients; in the proper warming and ventilation of the wards; in enforcing regularity of habits, exercise morning and evening in the open air, whenever the weather will permit, and in such wholesome employment as will exercise the body and occupy and divert the mind. All of these are essential to health, and are never neglected.

The farm and garden have yielded quite abundantly under the management of Mr. Palmer, the Seward. The former supplying us with most of the hay and all of the milk consumed in the Asylum, while the latter has produced all of the vegetables used by the patients, potatoes and beans excepted.

The milk, however, has not been as abundant as we could have desired. Owing to the small quantity of pasture lands attached to the Asylum only a limited number of cows can be kept to advantage, and at some seasons of the year we scarcely get enough for the tea and coffee, and for the use of the sick patients. I trust we will be able, next year, to reclaim the tule land on the Asylum tract and seed it with alfalfa, which, if suited to its growth, would afford us an abundance of hay, and a good pasture a portion of the year when most needed.

The Steward's report gives a detailed statement of the articles consumed, and all of the items of the current expenses of the Asylum during the year, including the pay-roll. The whole amount expended for maintenance was \$104,527 40. The average number of patients, 643½. The daily per capita expense, 44½ cents. The monthly per capita expense, \$13 37½, and the annual per capita expense, \$160 50.

It will thus be seen that the average daily cost of maintenance, per capita, has been reduced from \$1 81, when the Asylum was placed

under my charge, to the small sum of $44\frac{7}{12}$ cents. The increased number of patients and the strictest attention to economical expenditures has brought about this result. Under the admirable management of our Steward no waste has been permitted; every bill has been closely scrutinized, and no contractor has gotten more than his dues. The services of such a man are invaluable to a public institution. This figure, $44\frac{7}{12}$ cents per capita, is sufficiently low to satisfy the demand of the most stringent economist, and in my opinion it would be unwise and the poorest economy to attempt any further reduction; nor is it at all probable that it could be reduced, since our contracts will not often be let on more favorable terms than at present. Fuel, meat, flour, and potatoes are more likely to rise than to fall in price.

From the report of Doctor Hawthorne, Superintendent of the Oregon Asylum, for the year 1878, and the report of the special agent appointed to examine the charitable institutions of the State of New York, and submitted to the Senate of that State on the 9th day of April, 1879, I have abstracted the information contained in the following table:

TABLE

Showing the cost of maintenance of the principal Hospitals for the Insane in the United States, 1878, revised and corrected.

Location.	NAME OF HOSPITAL.	Number of patients intended to accommodate.	Annual cost of maintenance per patient.
Alabama, Tuscaloosa	Alabama Insane Asylum	400	\$182 00
California, Napa City	Napa State Asylum for the Insane	628	160 50
California, Stockton	California Insane Asylum	750	156 00
Connecticut, Middleton	General Hospital for Insane	450	250 00
District of Columbia, Washington	Government Hospital for Insane	563	223 15
Indiana, Indianapolis	Indiana Hospital for Insane	500	234 00
Iowa, Independence	Hospital for the Insane	400	200 00
Illinois, Jacksonville	Illinois State Hospital for Insane	600	199 66
Kentucky, Lexington	Eastern Lunatic Asylum	550	200 00
Maine, Augusta	Maine Insane Asylum	400	219 45
Massachusetts, Taunton	Taunton Lunatic Asylum	550	195 00
Massachusetts, Worcester	Worcester Lunatic Hospital	700	212 16
Massachusetts, Northampton	Northampton Lunatic Asylum	400	175 67
Minnesota, St. Peter	Minnesota Hospital for Insane	500	195 52
New Jersey, Trenton	New Jersey State Lunatic Asylum	500	260 00
New Jersey, Morristown	State Asylum for the Insane	900	245 96
New York, Willard	Willard Asylum for the Insane	1,500	170 04
New York, Utica	New York State Lunatic Asylum	600	263 12
New York, Blackwell's Island	New York City Lunatic Asylum	986	120 48
New York, Flatbush	Kings County Lunatic Asylum	450	208 00
Ohio, Longview	Longview Asylum	400	163 56
Ohio, Newburg	Cleveland Hospital for Insane	630	170 00
Ohio, Columbus	Columbus Hospital for Insane	902	157 00
Ohio, Dayton	Dayton Hospital for Insane	600	190 00
Ohio, Athens	Athens Hospital for Insane	600	206 38
Pennsylvania, Harrisburg	Pennsylvania State Lunatic Asylum	400	209 04
Pennsylvania, Danville	State Hospital for the Insane	700	232 44
Pennsylvania, Dixmont	Western Pennsylvania Hospital for Insane	400	250 12
Vermont, Brattleboro	Vermont Asylum for Insane	400	198 12
West Virginia, Weston	West Virginia Hospital for Insane	600	127 00
Wisconsin, Oskosh	Northern Hospital for Insane	550	234 00

The foregoing table shows the annual per capita cost of maintenance of thirty-one State Asylums for the insane, located in every section of the Union. For the purpose of a fair comparison I have excluded all corporate institutions, as the cost of maintenance is necessarily much greater in these than in State Asylums. For the same reason I have selected no Asylum that contains less than 400 patients, while most of them accommodate a much greater number. In only three of these Asylums is the cost of maintenance less than in this. In this Asylum the cost of maintenance includes every expense connected with its management—salaries and wages, fuel, food, ordinary repairs, clothing for most of the patients, and money furnished to discharged patients, and paid for returned escapes. It will be observed that for the purpose of this comparison I have placed the capacity of this Asylum at 628, which is its full proper capacity; its intended capacity being 544. The number that *can* and that *should* be accommodated are very different questions; the possibility only being considered in the one case, the propriety in the other. And I regret to say the rule of *possibility* is the one usually adopted with regard to the Asylums of this State.

EMPLOYMENT OF PATIENTS.

Much work has been accomplished by the patients since the date of my last report, a portion of which will be seen by reference to the report of the sewing-room, and products of the farm and garden.

The amount of grading and other work done upon the roads and grounds can only be appreciated by those who saw their condition a year ago and see them now. I regret that no account has been kept of the number of pieces washed at the laundry, chiefly by the patients, but it would be almost incredible if known.

The kitchen, under the management of Mr. Callaghan, the chief cook, is a model of neatness, and is the admiration of all visitors; its perfect cleanliness is especially appreciated and enthusiastically admired by the ladies. Its economical management, too, entitles Mr. Callaghan to the highest commendation.

The bakery is kept in excellent order by Mr. Conlon, who daily converts four barrels of flour into good and wholesome bread.

No change has taken place among the officers since my last report, with the exception of the appointment of a Junior Assistant Physician, and a Supervisor for the male wards. I congratulate the Board on the selection of Dr. F. W. Hatch, Jr., to fill the former position, since he has proven to be a valuable accession to the medical staff. Intelligent, kind, active, and attentive, he has become a general favorite in the household; studious in habits, untiring in his exertions to relieve the sick and cheer the down-hearted, I consider him eminently fitted for the place. Dr. Dozier, the Senior Assistant, has made himself so well known to the Board, and to the public, that he requires no commendation from me; nevertheless, it affords me unfeigned pleasure to bear testimony to his worth, whether in the capacity of physician, friend, or Christian gentleman. Whatever of success has been attained in the medical department of the Asylum is largely due to him.

The Supervisor, Mr. John Hawkes, has been watchful and efficient in the discharge of his duties, and can always be relied upon under

any circumstances; none other than a truthful, temperate, intelligent, and energetic man could properly discharge the responsible duties of Supervisor. His appointment has been a good one.

Mr. Stevens, the Secretary, has written his own commendation upon every page of his accurate and neatly kept books, and I refer you to them as the best evidence of his efficiency; they speak volumes.

Mr. Gray still presides over the apothecary shop, and discharges his duties in an efficient and satisfactory manner; and as he prepares all the tinctures used in the Asylum, it adds greatly to the economy of his department.

Mrs. Robinson still fills the position of Matron in a lady-like and satisfactory manner.

The other employés and attendants have generally been faithful in the discharge of their duties; but I regret to say there have been some exceptions to this rule. Some I have been compelled to discharge for dereliction of duty and unkindness to the patients. A few have been severely reprimanded for a lack of proper watchfulness, while a constant effort is made to impress upon all the absolute necessity of being ever-watchful while on duty to see that no patient is injured by others, and that all shall be kindly treated by themselves. It is a satisfaction to believe that this has generally been done. I believe that the attendants of this Asylum will compare favorably with those of any other similar institution in the country, and we will endeavor to improve rather than retrograde in this respect. It must not be overlooked that the position of an attendant in an asylum for the insane is a most delicate and responsible one; confining in its nature, and not devoid of danger, as many scars now borne by attendants inflicted by patients in this house will attest. Of these difficulties the outside world know but little, and make no allowance.

One difficulty under which we now labor is the small ratio of attendants to patients. The Association of Medical Superintendents of American Institutions for the Insane have given utterance to the following opinions on the organization of hospitals for the insane:

SECTION 10. In every hospital for the insane there should be one supervisor for each sex, exercising a general oversight of all the attendants and patients, and forming a medium of communication between them and the officers.

SEC. 11. In no institution should the number of persons in immediate attendance on the patients be in a lower ratio than one attendant to ten patients, and a much larger proportion of attendants will commonly be desired.

In this Asylum the ratio in the male wards is one attendant to sixteen patients, and while this is sufficient in the quiet and convalescent wards, it is not so with the wards for the excited and filthy patients. I therefore suggest the propriety of appointing second assistant attendants on such of those wards as may be deemed necessary; and also a supervisor for the female wards. While this would necessarily slightly increase the per capita cost, it would be of the greatest advantage to the patients, and would enable many of them to be on the outside with some employment or recreation who now spend their time in the yards, which are crowded with the excited maniac and stupid dement.

OBLIGATIONS.

Our thanks are due and hereby tendered to the proprietors of the following newspapers, who have kindly contributed to the pleasure of the patients, by regularly furnishing us with copies of their papers, viz.: the San Francisco Spirit of the Times, the Sacramento Daily Bee, the Mining and Scientific Press, the Rural Press, the Union Democrat, the Signs of the Times, and the Advent and Sabbath Advocate; and I trust that ere long we may be placed under similar obligations to many more publishers for similar favors.

The Reverends Todd, Kline, Wyley, Gardiner, Roberts, Kruger, and others have frequently held divine service in our chapel, for which we are very thankful.

Miss Katie Woods of Vallejo, kindly gave us an evening of reading, which contributed much to the entertainment of the patients and all who had the pleasure of hearing her.

The Georgia Minstrels and Kentucky Jubilee Singers each have paid us a visit and favored us with one of their excellent entertainments; and the manager of Chiarini's circus very kindly extended an invitation to all convalescent patients, who could do so, to visit an afternoon performance in Napa City, and quite a number were given permission to attend, who seemed greatly pleased with the privilege they had enjoyed.

In addition to the sum necessary to defray the current expenses of the Asylum for the next fiscal year, we will require, in my opinion, an appropriation of \$75,000, to be expended for the purposes hereinbefore mentioned, viz.: The construction of an Infirmary for each sex, 25 beds each; the fitting up and furnishing the attics for 150 patients; building barn, stable and cow house, reclamation of tule land on Asylum tract, building fences, laying pipes for sewers; books, periodicals, and pictures, piano and magic lantern; painting walls in wards, and for the improvement of the grounds.

In conclusion, I desire to impress this important fact upon the minds of all who have in any way to deal with the care of the insane, viz., that the increase of the insane will not be less than 150 per annum, and that the State is in duty bound to provide for their care and maintenance. Some regular system should be adopted for erecting plain, cheap, and substantial buildings for their reception and accommodation, and an annual or biennial appropriation made for this purpose.

To you, gentlemen, I must again express my sense of gratitude for the kind and courteous manner in which you have treated me, your prompt and generous response to my recommendations, and above all, for the continuation of that confidence which has been my highest reward.

Very respectfully,

E. T. WILKINS, Resident Physician.

NUMBER OF ADMISSIONS, RECOVERIES, DEATHS, ETC.

YEARS.	Admissions	Recoveries	Discharged Unimproved	Deaths	Escaped	Number Resident at the Close of Each Year	Increase	Whole Number Treated	Per cent. of Recoveries to Admissions	Per cent. of Deaths on the Number Treated
November 15th, 1875, to July 1st, 1876	321	69	20	20	4	208	208	321	21.49	6.23
July 1st, 1876, to July 1st, 1877	451	140	71	49	4	395	187	659	31.04	7.43
July 1st, 1877, to July 1st, 1878	433	148	71	70	11	528	133	828	34.11	8.45
July 1st, 1878, to July 1st, 1879	615	184	133	104	8	714	186	1,143	29.91	8.22
Totals	1,820	541	295	243	27	-----	714	-----	-----	-----

An analysis of the foregoing table shows that 1,820 patients have been admitted into the Asylum, of whom 541 have recovered and been discharged, 295 have been discharged as improved, 243 have died, and 27 have escaped.

TABLE I.

Showing the counties from which six hundred and fifteen patients were admitted, from June 30th, 1878, to July 1st, 1879.

COUNTIES.	Males.	Females.	Totals.
Alameda	39	23	62
Amador	2	1	3
Butte	4	1	5
Colusa	6	2	8
Contra Costa	4	1	5
Del Norte	1	-----	1
El Dorado	6	1	7
Humboldt	1	3	4
Kern	1	-----	1
Lake	1	-----	1
Los Angeles	10	5	15
Marin	10	-----	10
Mendocino	5	1	6
Mono	1	-----	1
Monterey	8	1	9
Napa	8	3	11
Nevada	12	1	13
Placer	11	-----	11
Plumas	1	-----	1
Sacramento	34	9	43
San Benito	2	1	3
San Diego	6	3	9
San Francisco	187	91	278
San Joaquin	1	-----	1
San Luis Obispo	6	1	7
San Mateo	5	1	6
Santa Barbara	3	2	5
Santa Clara	16	-----	16
Santa Cruz	7	2	9
Shasta	2	-----	2
Carried forward	400	153	553

TABLE I—Continued.

COUNTIES.	Males.	Females.	Totals.
Brought forward	400	153	553
Sierra	1	—	1
Siskiyou	7	—	7
Solano	8	5	13
Sonoma	8	10	18
Tehama	5	1	6
Trinity	2	—	2
Ventura	1	—	1
Yolo	5	1	6
Yuba	8	—	8
Totals	445	170	615

TABLE II.

Showing the nativity of six hundred and fifteen patients, admitted from June 30th, 1878, to July 1st, 1879.

NATIVITY.	Males.	Females.	Totals.
<i>United States.</i>			
Arkansas	—	1	1
Alabama	2	—	2
California	20	11	31
Connecticut	—	1	1
Delaware	—	1	1
Florida	1	—	1
Illinois	4	3	7
Indiana	1	4	5
Iowa	1	1	2
Kentucky	3	1	4
Louisiana	2	2	4
Maine	4	3	7
Maryland	3	1	4
Massachusetts	10	5	15
Michigan	1	—	1
Missouri	6	2	8
New Hampshire	1	1	2
New Jersey	3	—	3
New York	32	9	41
Ohio	12	3	15
Oregon	1	—	1
Pennsylvania	12	3	15
Rhode Island	2	—	2
Tennessee	2	—	2
Vermont	5	1	6
Virginia	7	1	8
United States	5	2	7
Totals	140	56	196
<i>Foreign Countries.</i>			
Australia	1	—	1
Austria	7	1	8
Bavaria	2	—	2
Canada	10	2	12
Central America	—	2	2
Chili	3	1	4
Carried forward	23	6	29

TABLE II—Continued.

NATIVITY.	Males.	Females.	Totals.
Brought forward	23	6	29
China	17	3	20
Denmark	3	—	3
England	39	8	47
Finland	1	—	1
France	11	5	16
Germany	46	21	67
Hayti	1	—	1
Holland	4	—	4
Hungary	1	—	1
Ireland	79	56	135
Italy	9	—	9
Mexico	7	2	9
New Brunswick	1	1	2
Newfoundland	1	—	1
Norway	4	1	5
Nova Scotia	2	—	2
Poland	1	1	2
Prussia	3	2	5
Portugal	7	—	7
Russia	3	—	3
Scotland	11	—	11
Spain	4	—	4
Sweden	7	1	8
Switzerland	6	2	8
Unknown	13	4	17
Wales	—	1	1
Western Islands	1	—	1
Totals	305	114	419
RECAPITULATION.			
United States	140	56	196
Foreign Countries	292	110	402
Unknown	13	4	17
Totals	445	170	615

TABLE III.

Showing the ages of six hundred and fifteen patients at the time of their admission in the Asylum, from June 30th, 1878, to July 1st, 1879.

AGES.	Males.	Females.	Totals.
Between 10 and 20 years	28	12	40
Between 20 and 30 years	105	41	146
Between 30 and 40 years	137	57	194
Between 40 and 50 years	85	35	120
Between 50 and 60 years	54	14	68
Between 60 and 70 years	17	4	21
Between 70 and 80 years	2	—	2
Between 80 and 90 years	1	1	2
Unknown	16	6	22
Totals	445	170	615

TABLE IV.

Showing the supposed cause of insanity of six hundred and fifteen patients, as stated in commitments, from June 30th, 1878, to July 1st, 1879.

SUPPOSED CAUSES.	Males.	Females.	Totals.
Apoplexy	1		1
Business troubles	12		12
Change of life		4	4
Childbirth		5	5
Congestive fever	1		1
Death of children	1		1
Death of mother	1		1
Disappointment	1		1
Disappointment in love	4		4
Disease of kidneys	1		1
Domestic troubles	5	14	19
Epilepsy	15	7	22
Excessive study	1		1
Grief		1	1
Hereditary	25	14	39
Ill health	7	6	13
Injury to head	14	1	15
Intemperance	42	4	46
Lactation		1	1
Loss of property	6	4	10
Masturbation	33		33
Old age	2	2	4
Organic disease of brain	1		1
Overwork	2	1	3
Paralysis	4	2	6
Puerperal condition		1	1
Religion	8	2	10
Sensational reading		1	1
Softening of brain	3		3
Spiritualism		1	1
Sunstroke	8		8
Suppressed menstruation		6	6
Syphilis	3		3
Unknown	240	88	328
Use of opium	3		3
Uterine troubles		5	5
Venerial disease	1		1
Totals	445	170	615

TABLE V.

Showing the class of insanity of six hundred and fifteen patients admitted from June 30th, 1878, to July 1st, 1879.

CLASS.	Males.	Females.	Totals.
Dementia	76	14	90
Dipsomania	3		3
Idiocy	1		1
Imbecility		1	1
Mania	212	105	317
Melancholia	35	11	46
Monomania	48	19	67
Nymphomania		1	1
Puerperal mania		4	4
Senile dementia	2	1	3
Unknown	68	14	82
Totals	445	170	615

TABLE VI.

Showing the civil condition of six hundred and fifteen patients admitted from June 30th, 1878, to July 1st, 1879.

CIVIL CONDITION.	Males.	Females.	Totals.
Married	116	106	222
Single	278	41	319
Widows	4	4	19
Widowers	10	10	10
Unknown	41	19	45
Totals	445	170	615

TABLE VII.

Showing the occupation of six hundred and fifteen patients, admitted from June 30th, 1878, to July 1st, 1879.

OCCUPATION.	Males.	Females.	Totals.
Artist	1	1	1
Bakers	5	5	5
Barbers	2	2	2
Butchers	5	5	5
Blacksmiths	8	8	8
Brass finisher	1	1	1
Boatman	1	1	1
Book-binder	1	1	1
Brewer	1	1	1
Bricklayer	1	1	1
Boiler-maker	1	1	1
Convicts	4	4	4
Carpenters	14	14	14
Cigar-makers	2	2	2
Cooks	7	2	9
Collectors	2	2	2
Clerks	13	13	13
Currier	1	1	1
Civil Engineer	1	1	1
Cooper	1	1	1
Confectioner	1	1	1
Dairymen	3	3	3
Dentist	1	1	1
Drayman	1	1	1
Domestics	18	18	18
Dressmakers	4	4	4
Engineers	2	2	2
Engraver	1	1	1
Farmers	31	31	31
Foundryman	1	1	1
Fisherman	1	1	1
Fireman	1	1	1
Gardeners	6	6	6
Horse-shoer	1	1	1
Horse-trainer	1	1	1
Hostlers	3	3	3
Harness-maker	1	1	1
Housewives	97	97	97
Laborers	114	114	114
Liquor dealers	2	2	2
Laundrymen	2	2	2
Carried forward	245	121	366

TABLE VII—Continued.

OCCUPATION.	Males.	Females.	Totals.
Brought forward	245	121	366
Laundress	1	1	1
Lime-burner	1	1	1
Longshoreman	1	1	1
Lawyer	1	1	1
Machinists	3	3	3
Miners	27	27	27
Merchants	8	8	8
Ministers	2	2	2
Music teachers	2	2	2
Marble-cutters	1	1	1
Mechanics	1	1	1
Mariners	2	2	2
Musician	1	1	1
No occupation	28	29	57
Painters	7	7	7
Plasterers	2	2	2
Peddlers	5	5	5
Physicians	2	2	2
Printers	3	3	3
Photographer	1	1	1
Plumber	1	1	1
Prostitutes	2	2	2
Shoemakers	8	8	8
School teachers	1	3	4
Salesmen	2	2	2
Stone-masons	2	2	2
Sheep-herders	7	7	7
Saw-filer	1	1	1
Stevedore	1	1	1
Sailors	20	20	20
Soldiers	3	3	3
Students	2	1	3
Stock-raisers	2	1	3
Ship carpenters	2	2	2
Servants	3	8	11
Sail-maker	1	1	1
Stage-driver	1	1	1
Tinsmiths	5	5	5
Teamsters	3	3	3
Tailors	2	2	2
Tanner	1	1	1
Telegraph operator	1	1	1
Unknown	27	4	31
Vaquero	1	1	1
Waiters	3	3	3
Watchmaker	1	1	1
Wood-carver	1	1	1
Totals	445	170	615

TABLE VIII.

Showing the cause of death of one hundred and four patients from June 30th, 1878, to July 1st, 1879.

Months.	CAUSE OF DEATH.	Nativity.	Age.	Males	Females
July, 1878	Exhaustion	Ireland	48	1	---
July, 1878	Consumption	Ireland	17	---	1
July, 1878	Suicide	New Jersey	40	1	---
July, 1878	Old age	New York	72	1	---
July, 1878	General paralysis	New York	46	1	---
July, 1878	Pleuro-pneumonia	Mexico	68	1	---
August, 1878	Paralysis	Ireland	39	1	---
August, 1878	Epilepsy	Wales	42	1	---
August, 1878	Maniacal exhaustion	Italy	38	1	---
August, 1878	General debility	Kentucky	47	---	1
August, 1878	Paralysis	Ireland	56	1	---
August, 1878	General debility	Massachusetts	17	---	1
August, 1878	Consumption	Ireland	28	---	1
August, 1878	Chronic Inflammation of large bowel	England	66	1	---
August, 1878	Paralysis	Ireland	35	1	---
August, 1878	Organic disease of brain	England	62	1	---
August, 1878	General paralysis	Germany	42	1	---
September, 1878	Septicæmia	Italy	38	1	---
September, 1878	General debility	Germany	64	1	---
September, 1878	Marasmus	China	36	1	---
September, 1878	Dropsy of gall bladder	Maine	60	1	---
September, 1878	Dropsy	England	45	1	---
September, 1878	General debility	California	60	---	1
September, 1878	Paralysis	Vermont	41	1	---
October, 1878	Exhaustion	Delaware	28	---	1
October, 1878	Paralysis	United States	37	1	---
October, 1878	Congestion of brain	Tennessee	50	1	---
October, 1878	Consumption	Ireland	33	---	1
November, 1878	Maniacal exhaustion	France	34	1	---
November, 1878	Paralysis	Portugal	42	1	---
November, 1878	Marasmus	New York	38	1	---
November, 1878	Exhaustion	Ireland	46	1	---
November, 1878	Paralysis	Unknown	55	1	---
November, 1878	Consumption	New York	20	1	---
November, 1878	Marasmus	Bavaria	34	1	---
December, 1878	Inanition	Ireland	45	1	---
December, 1878	Inanition	Ireland	55	1	---
December, 1878	Consumption	Portugal	22	1	---
December, 1878	Paralysis	Hayti	35	1	---
December, 1878	Old age	France	64	1	---
December, 1878	Maniacal exhaustion	England	38	1	---
December, 1878	Erysipelas	Germany	51	1	---
December, 1878	Paralysis	Pennsylvania	52	1	---
December, 1878	Epilepsy	Unknown	16	---	1
December, 1878	Consumption	Germany	36	---	1
December, 1878	Old age	Pennsylvania	82	1	---
December, 1878	Paralysis	Ohio	50	1	---
December, 1878	Paralysis	Germany	56	1	---
December, 1878	Inanition	Ohio	30	1	---
December, 1878	Consumption	Unknown	Unknown	1	---
December, 1878	Old age	France	60	1	---
December, 1878	General paralysis	New York	52	1	---
January, 1879	Suicide	Switzerland	30	1	---
January, 1879	Paralysis	Germany	42	---	1
January, 1879	Paralysis	Ireland	40	1	---
January, 1879	Consumption	California	19	---	1
January, 1879	Paralysis	Italy	39	1	---
January, 1879	Paralysis	Germany	63	1	---
January, 1879	Epilepsy	Indiana	31	---	1
January, 1879	Septicæmia	Canada	40	1	---
January, 1879	Paralysis	New York	35	---	1

TABLE VIII--Continued.

Month.	CAUSE OF DEATH.	Nativity.	Age.	Males	Females
January, 1879	Injuries from fall	Maryland	44	1	---
January, 1879	Paralysis	Rhode Island	52	1	---
January, 1879	Epilepsy	New Guinea	45	1	---
January, 1879	Paralysis	Louisiana	31	1	---
February, 1879	Paralysis	Ireland	38	1	---
February, 1879	Epilepsy	England	17	1	---
February, 1879	Maniacal exhaustion	France	33	---	1
February, 1879	Exhaustion	New York	36	---	1
February, 1879	General paralysis	Massachusetts	37	1	---
February, 1879	Paralysis	Sweden	35	1	---
February, 1879	Organic disease of brain	Ireland	47	1	---
February, 1879	Apoplexy	France	42	1	---
March, 1879	Inanition	England	45	1	---
March, 1879	Cancer of intestines	England	40	1	---
March, 1879	General paralysis	Germany	33	---	1
March, 1879	Anemia	New York	42	---	1
March, 1879	Old age	England	50	1	---
March, 1879	Paralysis	New Jersey	49	1	---
March, 1879	General paralysis	England	38	1	---
April, 1879	Exhaustion	Maryland	23	1	---
April, 1879	Serous effusion	New York	42	1	---
April, 1879	Anemia	China	Unknown	---	1
April, 1879	Consumption	United States	40	1	---
April, 1879	Peritonitis	Germany	30	---	1
April, 1879	Exhaustion	Ireland	61	---	1
April, 1879	Dropsy	Italy	38	1	---
April, 1879	General paralysis	Ireland	29	1	---
April, 1879	Old age	New York	77	1	---
May, 1879	Consumption	Canada	45	1	---
May, 1879	Ulceration of bowels	Portugal	Unknown	1	---
May, 1879	Maniacal exhaustion	United States	34	1	---
May, 1879	Homicide	England	25	1	---
May, 1879	Paralysis	Germany	38	---	1
May, 1879	Paralysis	Ohio	52	1	---
May, 1879	Organic disease of brain	Spain	44	1	---
May, 1879	Stricture of small intestine	Virginia	62	1	---
June, 1879	Paralysis	Ireland	35	1	---
June, 1879	Aneurism of abdominal aorta	Germany	40	1	---
June, 1879	Exhaustion	New York	19	---	1
June, 1879	Paralysis	New York	Unknown	1	---
June, 1879	Organic disease of brain	Ireland	40	---	1
June, 1879	Exhaustion	Indiana	41	---	1
June, 1879	Anemia	Ireland	Unknown	1	---

TABLE IX.

Recapitulation of the cause of death of one hundred and four patients, from June 30th, 1878, to July 1st, 1879.

CAUSE OF DEATH.	Males.	Females.	Totals.
Anemia	1	2	3
Consumption	5	5	10
Dropsy	3		3
Epilepsy	3	2	5
Exhaustion	3	5	8
General debility	2	2	4
General paralysis	7	1	8
Inanition	7		7
Maniacal exhaustion	4	1	5
Old age	6		6
Organic disease of brain	3	1	4
Paralysis	21	3	24
All other causes	15	2	17
Totals	80	24	104

TABLE X.

Showing the articles made in the sewing-room from June 30th, 1878, to July 1st, 1879,

ARTICLES.	Number.
Aprons	305
Bath-towels	177
Bed-straps	35
Bed-ticks	316
Bibs	47
Boys' jackets	6
Brown sheets	1,276
Carpet-mats	98
Carpets	5
Check jackets	13
Chemises	139
Damask table-cloths	14
Drawers	82
Dresses	247
Duck jackets	48
Duck pants	29
Duck quilts	32
Flannel shirts	12
Flannel skirts	131
Jumpers	4
Linen table-cloths	107
Napkins	120
Night-gowns	159
Pillow-slips, check	732
Pillow-slips, white	910
Pillow-ticks	388
Roller towels	189
Sacques	19
Shirts	85
Skirts	44
Sun-bonnets	4
Suspenders	76
Waists	17
White sheets	102

TABLE FIRST.

Steward's account of articles consumed and purchased, and other expenses, for the fiscal year ending June 30th, 1879.

ARTICLES.	Value.
Flour	\$5,974 90
Meat	8,304 42
Sugar	2,240 62
Tea	557 64
Syrup	1,470 77
Potatoes	2,269 09
Butter	3,959 31
Coffee	1,239 74
Lard	102 84
Fish	265 85
Poultry and eggs	869 56
Beans and peas	530 96
Rice and cracked wheat	371 38
Corn meal and oatmeal	344 18
Fruit	443 90
Vegetables	10 14
Salt	76 88
Vinegar	75 40
Small groceries	446 76
Soap	881 98
Drugs	1,050 97
Liquor and ale	534 71
Tobacco	901 91
Dry goods	3,337 44
Clothing and hats	2,690 22
Shoes and leather	1,197 45
Blankets	2,769 83
Furniture and crockery	3,176 77
Hardware and tinware	1,723 61
Spoons and cutlery	148 37
Feathers and hair	458 32
Hay and straw	142 36
Grain and feed	275 83
Garden tools and seed	20 38
Lumber	593 72
Repairs	586 23
Brooms and brushes	385 50
Books and stationery	577 45
Oil, glass, and paints	567 19
Ice	71 22
Fuel	9,805 65
Traveling expenses	379 75
Cows and hogs	130 44
Wagons	150 00
Hose	456 00
Carpeting	394 45
Bedding	1,643 50
Gas	1,523 13
Miscellaneous	724 77
Discharged patients	701 80
Returned escapes	278 85
Interest and exchange	36 20
Pay-roll	46,805 91
Total	\$114,676 25

TABLE SECOND.

Showing the cost of the different departments for the fiscal year ending June 30th, 1879.

DEPARTMENTS.	Cost.
Kitchen and dining-rooms	\$23,652 72
Wards	8,767 52
Bakery	6,077 56
Laundry	655 97
Engineer's department	156 23
Farm, garden, dairy, and stable	740 26
Building material and repairs	2,381 54
Miscellaneous	661 34
Drug store	1,184 83
Furnishing	9,638 66
Office	559 22
Fuel	9,805 65
Discharged patients and returned escapes	980 65
Interest and exchange	36 20
Gas	1,523 13
Traveling expenses	379 75
Pay-roll	46,805 91
Center building	669 11
Total	\$114,676 25

TABLE THIRD.

Averages for the year ending June 30th, 1879.

MONTHS.	Average Number of Patients Daily	Average Daily Expenses	Average Cost per Capita per Day	Average Cost per Capita per Month.
July, 1878	543	\$251 00	.46	\$13 80
August, 1878	578	269 08	.47	14 10
September, 1878	591	286 32	.48	14 40
October, 1878	613	269 20	.44	13 20
November, 1878	642	310 15	.48	14 40
December, 1878	650	290 75	.45	13 50
January, 1879	657	300 45	.46	13 80
February, 1879	671	310 25	.46	13 80
March, 1879	683	289 43	.42	12 60
April, 1879	686	302 72	.44	13 20
May, 1879	699	281 92	.40	12 00
June, 1879	709	279 99	.39	11 70
Yearly averages	643½	\$286 77½	.447½	\$13 37½

TABLE FOURTH.

Products of the farm, garden, and dairy, for the fiscal year ending June 30th, 1878.

ARTICLES.	Amount.
Cabbage, pounds	60,590
Beets, pounds	18,126
Green peas, pounds	935
Onions, pounds	2,478
Lettuce, pounds	1,830
String beans, pounds	1,987
Turnips, pounds	13,104
Cucumbers, pounds	5,987
Carrots, pounds	7,616
Tomatoes, pounds	6,090
Cauliflower, pounds	1,726
Radishes, pounds	57
Parsley, pounds	18
Cellery, pounds	459
Red pepper, pounds	213
Watermelons	40
Canteloupes	2
Pumpkins	124
Eggs, dozens	1,203½
Chickens, dozens	26½
Green corn, dozens	39
Milk, gallons	12,449
Hay, tons	70

NUMBER OF OFFICERS AND EMPLOYÉS

In the Asylum on the 30th day of June, 1879, and the salary paid each.

One Resident Physician	\$250 00
Two Assistant Physicians	166 66
One Secretary	100 00
One steward	150 00
One supervisor	75 00
One matron	50 00
One seamstress	40 00
One carpenter	90 00
One engineer	100 00
One druggist	65 00
One steward's clerk	75 00
Twenty-four attendants	45 00
Twenty-three assistant attendants	35 00
One night-watch (male department)	50 00
One night-watch (female department)	45 00
One outside night-watchman	40 00
One messenger	40 00
One cook	75 00
One cook	50 00
One assistant cook	50 00
One assistant cook	40 00
One baker	60 00
One assistant baker	35 00
One laundryman	70 00
One assistant laundryman	30 00
One assistant laundryman	20 00
One fireman and plumber	50 00
One fireman	50 00
One gardener	40 00
One farm laborer	35 00
One farm laborer	25 00
One laborer	20 00
One hostler	35 00
Two waiters	30 00
One porter	30 00

THIRTEENTH REPORT OF THE BOARD OF DIRECTORS AND OFFICERS

OF THE

CALIFORNIA INSTITUTION FOR THE EDUCATION

OF THE

DEAF AND DUMB, AND THE BLIND,

FOR THE

TWENTY-FOUR MONTHS ENDING JUNE 30, 1879.

BOARD OF DIRECTORS.

J. MORA MOSS	President.
JOHN A. STANLY	Vice-President.
E. J. CRANE	Auditor.
THOMAS YOLLAND, JOHN GARBER,	
H. A. PALMER	Secretary and Treasurer.

OFFICERS OF THE INSTITUTION.

PRINCIPAL.

WARRING WILKINSON, M. A.

TEACHERS OF THE DEAF AND DUMB.

GEORGE B. GOODALL, M. A.,
 FOLAND P. FOWLER,*
 HENRY FRANK,
 THEOPHILUS D'ESTRELLA,
 WILLIAM A. CALDWELL,
 NETTIE STEWART,
 PHEBE J. WRIGHT.

TEACHERS OF THE BLIND.

CHARLES T. WILKINSON,
 MRS. ANGÉLIQUE R. GOODALL.

TEACHER OF MUSIC.

GEORGE B. GOODALL, M. A.

TEACHER OF WOOD CARVING.

L. A. DOCHEZ.

DOMESTIC DEPARTMENT.

WM. M. LAWLOR	Physician.
GEORGE J. ILLIDGE	Clerk.
MRS. HARRIET B. WILLARD	Matron-in-Chief.
MRS. M. S. BILLINGS	Matron of "Girls' Home."
MISS J. OSGOOD	Matron of "Boys' Home."
MISS M. E. SHARR	Nurse.

MECHANICAL DEPARTMENT.

FRED. HANSEN	Engineer.
E. P. PIKE	Carpenter.

* Deceased, September 8th, 1879.

REPORT.

OFFICE OF THE BOARD OF DIRECTORS OF THE CALIFORNIA
INSTITUTION FOR THE DEAF AND DUMB, AND THE BLIND, }
BERKELEY, October, 1879.

To *His Excellency, William Irwin, Governor of the State of California:*

SIR: In the temporary absence of J. Mora Moss, President, and in behalf of the Board of Directors of the Institution for the Deaf and Dumb, and the Blind, I herewith respectfully submit their report for the two years ending June 30th, 1879.

By referring to the report of the Principal, herewith annexed, it will be seen that there have been under instruction one hundred and forty-seven pupils during the last two years. Of these, fifty-three were new pupils, a much larger number than this Institution ever admitted before in the same length of time. Twenty-seven have been graduated or discharged, and one has died, leaving on the school register, June 30th, one hundred and twenty-five names.

Tabulated, the changes are as follows:

On rolls June 30th, 1877	100
Admitted	53
	153
Graduated or discharged	27
Died	1
	28

On rolls June 30th, 1879 125

Admitted since re-opening of term:

Deaf and dumb	6
Blind	2
	8

Total at date of writing 133

The receipts and expenditures, as per Treasurer's statement and Principal's dissections, have been as follows:

GENERAL FUND.

Receipts.

Cash on hand June 30th, 1877	\$11,551 29
From State Treasurer	72,000 00
From Principal's receipts	4,401 56
	\$87,952 85

Expenditures.

For current expenses, as per Principal's dissections	\$67,712 28
Treasurer's salary	1,000 00
Collections, carriage hire, etc.	277 75
	68,990 03
Balance, which has been loaned to Building Fund	\$18,962 82

At the date of the last report the contract with Mr. Boone for the erection of two buildings was not completed. The present statement therefore exhibits the total receipts and expenditures in the direction of buildings and improvements for four years, ending June 30th, 1879, tabulated as follows:

BUILDINGS AND IMPROVEMENTS.

Receipts.

From State treasury appropriation-----	\$110,000 00
From Shop and Improvement Fund, including interest-----	5,370 04
From loan from General Fund-----	18,962 82
From overdraft on Union Savings Bank-----	4,317 85
	<hr/>
	\$138,650 71

Expenditures.

W. E. Boone, contract for two "Homes"-----	\$84,500 00
N. R. Tucker, Superintendent, salary-----	2,000 00
Wright & Sanders, architects' fees-----	4,225 00
Discount on silver-----	261 00
	<hr/>
	\$90,986 00
A. J. McKee, contract for refectory, laundry, and Principal's residence--	\$27,150 00
N. R. Tucker, Superintendent, salary-----	1,600 00
Wright & Sanders, architects' fees-----	1,357 50
Discount on silver-----	9 00
	<hr/>
	30,116 50
General expenses—advertising, rent, and attorney's fees-----	531 97
	<hr/>
	\$121,634 47
Furnishing and fitting new buildings-----	\$5,261 44
Machinery, etc., new boiler-house, and laundry-----	3,953 33
Gas works, fixtures and pipes, water and sewer pipes-----	3,818 78
Tunnel, 508 feet-----	1,729 15
Brick cistern-----	785 93
Improvement of grounds-----	1,467 61
	<hr/>
	17,016 24
	<hr/>
	\$138,650 71

It will thus be seen that at the close of the fiscal year there was an overdraft at the Union Bank, representing an actual deficit of \$4,317 85, which will need to be made good by an appropriation. There will also be some deficit in current expense account for the six months ending December 31st, 1879. The Directors are not prepared to say how much it will be, but it is evident that with the large increase of pupils, amounting to about thirty-three per cent., an increase of expenditure must follow.

After the failure of the bill making appropriations for further building operations, for furnishing the new "Homes," and increasing the water supply, it was determined by the Board to consolidate its available funds and do as much as possible to relieve the pressing wants of the Institution.

Plans were ordered drawn for a portion of the Refectory building, a boiler-house and laundry, and a residence for the Principal. After due approval of plans by your Excellency, Secretary of State, and Treasurer, bids were solicited, and on the 27th day of July, 1878, the proposals were opened and the contract awarded to A. J. Warren & Company, for the sum of \$24,981. As Messrs. Warren & Company failed to qualify, the Board readvertised, and on the 14th day of September, 1878, opened new bids and awarded the contract to A. J. McKee, for the sum of \$27,150. The buildings have been finished,

and are now occupied. Suit has been commenced against the sureties of Warren & Company to reimburse the Board for damages in failing to enter into contract, and thus compelling the Board to readvertise. The suit is still pending.

In view of the increasing numbers and needs of the Institution, the Directors respectfully ask that the usual appropriation of \$36,000 a year be increased to \$40,000.

They further ask for an appropriation—

For an additional "Home"	\$51,500 00
For completing the Refectory and gymnasium	13,500 00
For educational building	70,000 00
For increasing water supply	5,000 00
For improvement of grounds	5,000 00
For brick foundation under shop building	3,000 00
Total	<u>\$148,000 00</u>

The Treasurer's statement will show the condition of the various funds of the Institution, arising from bequests, etc.

The Monje Fund and the Beideman Fund have been consolidated with the Exhibition Fund, and has been set apart as the nucleus of a Library Fund. It now amounts to \$2,532 77.

The Organ Fund, the gift of Messrs. Wright & Sanders, has at present date \$1,040 21 to its credit. In the matter of the Durham bequest a compromise has been effected, and a sum, netting, with interest, \$37,772 05, has been paid to the Directors. Of this sum \$30,000 has been loaned on bond and mortgage, and the remainder is on deposit in the Union Savings Bank, Oakland.

The Directors beg to refer to the Principal's report for a detailed account of the operations of the Institution for the past two years. They would especially call the attention of your Excellency and the Legislature to the importance of reëstablishing the mechanical department. The Institution can never be considered complete in its appointments and work until our pupils are provided with the proper means of instruction in handicraft.

The question of water supply, referred to by the Principal in his report, is a matter of most vital importance not only to the health and comfort of the pupils, but possibly to the very existence of the Institution. It would be easy to show how, in kindred Institutions, epidemics of typhoid fever have followed stinted supplies of water. This present year the Illinois Institution for the Deaf and Dumb has been forced to suspend operations until November 15th, on account of lack of water.

The long dry seasons of California make it specially needful that for sanitary and economic reasons the supply of water for an establishment of this kind should be abundant and reliable.

Four years ago an Act was passed setting apart for condemnation all the creeks and springs within one and a half miles of the University, for the joint use of the University and this Institution, but, as the authority for carrying out the provisions of the law was left in other hands, the Board has not been able to derive any benefit from the thoughtful intention of the Legislature. The Directors, therefore, most earnestly hope that the incoming Legislature will make such provision as will enable the Board to furnish the Institution with an abundant supply of water.

The Board, as well as the whole State, has suffered a severe loss,

since their last report, in the death of Director H. H. Haight, which occurred September 2d, 1878.

It is perhaps needless at this time and place to eulogize one whose highest praise was the profound sorrow with which the notice of his death was received throughout the commonwealth in which he had played so prominent a part. The Directors, however, desire to express their high appreciation of his character, and those many virtues which so specially fitted him for positions of trust, and their deep sense of loss to their counsels by his sudden demise.

The vacancy caused by Governor Haight's death has been filled by the appointment of John Garber.

Thomas Yolland has also succeeded D. D. Shattuck, whose term expired February, 1878, and E. J. Crane has been reappointed.

In closing this report the Directors desire to commend the officers of the Institution for their faithfulness and zeal in the work they have to do. They also ask the favorable consideration of the Legislature for this beneficent Institution, whose claim for liberal support stands second to none, whether one considers the relief to misfortune which it affords, or its benefit to the State in making good and productive citizens out of an otherwise useless, if not dangerous, element of society.

Respectfully submitted.

JNO. A. STANLY,
Vice-President.

REPORT OF THE PRINCIPAL.

To the Board of Directors of the California Institution for the Deaf and Dumb, and the Blind :

GENTLEMEN: I have the honor herewith to submit the thirteenth report of this Institution, embracing the details of its work for the two years ending June 30th, 1879.

NUMBER OF PUPILS.

Since the date of my last report the movement of pupils has been as follows :

On the rolls June 30th, 1877 :

DEAF AND DUMB.		
Males	44	
Females	27	
		71
BLIND.		
Males	19	
Females	10	
		29
Total both classes		100

The admissions since same date have been :

DEAF AND DUMB.		
Males	28	
Females	18	
		46
BLIND.		
Males	2	
Females	5	
		7
Total admissions, both classes		53
Total under instruction		153

There have been graduated and discharged since same date :

DEAF AND DUMB.		
Males	13	
Females	5	
		18
BLIND.		
Males	7	
Females	2	
		9
Died		1
Total		28

On the rolls June 30th, 1879 :

DEAF AND DUMB.	
Males -----	59
Females -----	40
	<hr/> 99
BLIND.	
Males -----	14
Females -----	12
	<hr/> 26
Total both classes -----	125
Admitted since opening of term :	
Deaf and dumb -----	6
Blind -----	2
	<hr/> 8
Total on rolls October 5th, 1879 -----	133

This great and rapid increase of pupils is to a certain extent the legitimate and expected result of increasing population and diffused information among the people concerning the Institution and its work.

The deaf-mute and blind have profited perhaps more than any other class by the advance in public sentiment which has taken place of late years in regard to education. If liberty without intelligence to comprehend its limitations is a doubtful boon in the hands of the masses, it is absolutely dangerous in the hands of those who, from the nature of their affliction, can have no knowledge of human or divine law; and so it has come to be that the instruction of the deaf and dumb, which had its beginning in religious zeal and sympathy, is now looked upon as a social duty and safeguard, while the care and expense have been transferred from the church and the benevolence of a few individuals to the State, which assumes the charge, not as a charity, but as a wise measure of political economy.

I should, however, be sorry to believe that thirty per cent. increase is to be hereafter the biennial ratio of growth. The unprecedented increment since my last report is largely due to the ampler accommodations which the completion of our new buildings placed at the disposal of the Directors. Since the fire of 1875 admissions have been allowed only as vacancies occurred, and many names have, from month to month, been placed on file of applications, to be considered when there was room for more pupils. And thus it happens that within eight months forty-four new pupils have entered school.

HEALTH.

One death has occurred since the date of my last report, two years ago. A little blind girl from Stockton, named Flora Walrod, was attacked with diphtheria shortly after entering school, and in spite of the tenderest care and the best medical skill, died on the 27th of September, 1877. With this exception, the good health of the pupils for the past two years is a matter for gratitude. The ailments have generally been of the most trifling character, and have speedily yielded to medical treatment.

In this connection a word in behalf of our physicians may not be

amiss. Dr. J. M. Selfridge, who for six years had held the office, resigned in April, 1878. During this long period no harsh word ever passed between us. He administered to the needs of the children when ill with great success, and by his kindness and sympathy in the sick-room and in the ordinary relations of life, endeared himself to the pupils and to the household. Dr. Wm. M. Lawlor, who was elected to the vacant office, by his prompt answer to calls and his unremitting attention to duty, merits the approbation of the Board, while his success in the treatment of the various ailments of so large a family has won the confidence and respect of both officers and pupils.

The principal event since the last report has been the completion and occupation of two new buildings. These "Homes," as they are called, are part of a plan which looks to and offers opportunity for almost indefinite expansion. They are plain in exterior ornamentation, but are constructed in the most substantial manner and upon well considered sanitary principles. They serve their purpose admirably well, and I am confident that this plan of segregated buildings, when carried to completion, will meet the approval of all those whose attention has been given to the housing and caring for large numbers of people.

The system, however, to give its best results, ought to be carried to something nearer completeness immediately. The two "Homes" now occupied are both designed for boys, and are on one side of the quadrilateral which the plan contemplates. We have been forced to use one for girls, who ought to be in a house of their own, and separated by the intermediate buildings, which it is hoped the coming Legislature will provide for. The boys' house is more than full, and the overplus is now lodged in the old wooden shop, which is thus diverted from its original use, and an important department of institution work—the mechanical—is held in abeyance.

And, in this connection, I desire to say that the Board cannot too strongly urge upon the attention of the Legislature the great need of reestablishing the workshops upon a substantial and permanent basis. The theory and former practice of the Institution has been to carry on simultaneously an education of the head and hand—to devote assigned portions of each day to work in the school and work in the shop. It has been found no hindrance to intellectual progress that the afternoons were given to learning a handicraft. On the contrary, there has been a mutual benefit. The intelligence acquired in the morning class-room has directed the skillful fingers in the work they had to do in the afternoon, while the change of occupation and rest from mental activity has made more vigorous study possible and easy.

The increasing number of pupils, as well as popular sentiment, makes it necessary that the shops should be thoroughly equipped with experienced foremen and machinery of the best and most approved kind. If we could vacate the building now used for schools and dormitories, put beneath it a brick foundation, and fit it up with the machinery needed for carrying on two or three branches of industry, there would be little left to desire in the direction of mechanic arts, and our pupils would leave the Institution provided not only with that intellectual education which fits men to exercise the duties of citizenship, but also that manual training for productive industry upon which a State's prosperity is based.

THE SCHOOLS.

The intellectual results of the last two years have been satisfactory. The teachers have been faithful and zealous; the pupils have, as a rule, been studious, docile, and well-behaved. There has been nothing of the nature of insubordination; there is not among our large number a malicious boy or girl. There has been an occasional tendency to the mischief that comes of thoughtlessness; but this has been almost invariably in the case of young pupils who have not yet reached the age or intellectual development when the moral sense asserts itself. One of the most interesting features of deaf-mute instruction, and to the teacher the chief reward of his services, is watching the birth of moral sentiments and the growth of character, of manliness and womanliness, in these children of silence and darkness. It is a common mistake of the outside world, and often of teachers themselves, to judge of the work and value of a school for the deaf and dumb by the mere use of the English language which pupils acquire. There are deaf-mutes who never obtain other than a bungling use of written language, and yet they often develop under the stimulus of signs as fine and delicate a sense of moral distinction, and as noble traits of character, as those who have greater facility in verbal expression. There are people living among us who for years have had the advantage of hearing and constant communication with their fellows, but who have never acquired a grammatical use of our tongue. Every reader will recall as an example some intelligent German or Frenchman of his acquaintance. And yet German and French and English are kindred languages, having many words and constructions similar, often identical. Is it strange then that the deaf-mute, whose vernacular is a language having no relation to words or any recognized symbols of tongue or pen, should find it difficult to translate his thoughts from the symbolism of manual signs into the phraseology of our Saxon speech? But if the lingual attainment of the deaf-mute is to be compared with that of any hearing and speaking foreigner, it should be with him whose tongue is farthest removed from the English speech. The following is a verbatim copy of an application for work received by a San Francisco merchant from a Chinaman:

"My dear jack last Saturday i in Californium St meet You me ask You my like come to work for you agin. You tell my come monday morning. Sunday i go ask Ah Duck him say i cannot come work i am love you all time you kind to me. Tell Ah Duck spack me come i am come

Affaction

AH LOOK."

A Hawaiian schoolmaster, a *teacher* of English, thus writes to one of his patrons:

"DEAR SIR: I have a few remarks to tell your kindness as this. I wish you to pay me the tuition of your two sons for the sum of two dollars. Because my wife shall be off this week, so I hope you shall assist me without an objection.

Yours, truly, — — —."

Teachers of the deaf and dumb will recognize the curious similarity of construction between these specimens of composition and the struggles of many a deaf-mute to express himself in written language.

The studies of the class-rooms during the last two years have not

varied much from those previously reported. Each year has been closed with a long and severe examination in all the studies pursued, in which most of the pupils have done credit to themselves and their teachers.

FINANCIAL MATTERS.

The Treasurer's balance sheet shows as follows:

RECEIPTS.	
In General Fund, June 30th, 1877	\$11,551 29
From State treasury, appropriation for two years ending June 30th, 1879	72,000 00
From Principal, on account Nevada pupils, clothing, etc., to same date	4,401 56
Total	\$87,952 85

DISBURSEMENTS.	
For salaries and wages	\$33,760 95
For groceries and provisions, as per dissections	14,153 52
For clothing, as per dissections	2,260 35
For furniture, as per dissections	1,613 81
For building and repairs	957 20
For fuel and light	5,385 25
For dairy and stable	3,017 14
For laundry	2,447 57
For miscellaneous	4,116 49
Total	\$67,712 28

OFFICE EXPENSES.	
Secretary and Treasurer's salary	\$1,000 00
Carriage hire, collections, etc.	277 75
	1,277 75
	68,990 03
Balance loaned to Building Fund	\$18,962 82

It will be seen by this statement that the Building and Improvement Fund is indebted to the General Fund in the sum of \$18,962 82. This money is the accumulation of about ten years. It has come from receipts from Nevada beneficiaries, shop and petty sales, payments for clothing, etc. As the law requires all such receipts to be used for the benefit of the Institution, the money ought to be paid back into the General Fund. If this is not done, it will be necessary to increase the usual appropriation from \$36,000 to \$40,000, and to pass a deficiency bill, the exact amount of which cannot as yet be stated.

At the last session of Legislature a bill was passed appropriating \$63,500 for the following purposes:

For additional "Home"	\$51,500 00
For boiler-house and laundry	5,000 00
For furnishing new buildings	5,000 00
For increasing water supply	2,000 00
	\$63,500 00

Unfortunately these appropriations were put in an omnibus bill, making provisions for a number of State institutions. The principle is a bad one, as every appropriation ought to, and by the terms of the new Constitution must, stand upon its own merits. Either to vindicate a principle, or because he thought some of the appropriations were not absolutely essential, his Excellency, Governor Irwin, declined to approve the bill, and it failed to become a law.

The failure of the appropriation left the Board in great perplexity. It seemed to involve two years of absolute standstill in a work whose increasing proportions demanded continual progress. Fortunately there was about \$19,000 left of the former appropriation. Adding to this the surplus which had been accumulating from the sources mentioned above, the Board found at its disposal an aggregate sum of between \$35,000 and \$40,000. Messrs. Wright & Sanders, architects, in connection with the Principal, were instructed to prepare plans of such buildings as were most immediately needed, and which could be erected within the limits of the funds on hand. Accordingly drawings were made of a portion of the central refectory. It included a kitchen, meat-house, larder, closets, and men's dining-room, and sleeping apartments for the cooks, engineer, etc. So much was to be complete. The foundations were to be laid for a number of other offices, such as store-room, dining-room, pantries, milk-room, and officers' dining-room, the walls of which were brought to the first floor. All these future rooms were then thrown into one to form a temporary refectory for the pupils. The estimate for this building, constructed in the most substantial manner, with concrete foundations and slate roof, was \$20,000. A boiler house and laundry, 30x40 feet, two stories high, was planned at a cost of \$4,000, and a cottage for the Principal, at a cost of \$5,000, making a total of \$29,000. When the plans were completed his Excellency, Governor Irwin, was invited to meet the Board, and, with his approbation, it was determined to go on with the work. The plans, according to the terms of what is known as the O'Connor Bill, regulating the construction of State work, were submitted to the Governor, Secretary of State, and Treasurer, and were approved. Advertisements soliciting bids were inserted in the San Francisco Call, Chronicle, and Examiner, Oakland Tribune, and Sacramento Record-Union, for four weeks, at the end of which time the proposals were opened in full Board. A. J. Warren & Company, submitting the lowest proposal, were awarded the contract for \$24,981, subject to the filing of required bonds. Messrs. Warren & Company failing to qualify, the Board re-advertised, and, as a result, the contract was awarded to A. J. McKee for the sum of \$27,150. The work has all been done, and, at present writing, the buildings are occupied for their various uses.

It is perhaps worthy of remark that this is the third contract which the Board has carried to completion without a single dollar being paid for changes or extras. It would seem to prove that well-considered plans, drawn under the supervision of those who know what is required, and in the hands of a judicious, pains-taking Board of Directors, need not involve the State in expenditures far beyond the contract price.

In addition to the buildings erected during the past two years, a great amount of valuable and necessary improvement has been done at the very minimum of cost. The new laundry has been fitted up with the most improved labor-saving machinery, driven by a fifteen-horse power engine. All the pipe fitting, steam drying apparatus, and water connections, were made by our own engineer. A Springfield gas machine of 300-light capacity, and costing, with its connections and gas fixtures, about \$2,000, has been put in. Six thousand seven hundred and twenty-eight feet of water and gas pipe have been laid, and 2,392 feet of sewer drains at a total cost, including the gas machinery, of \$3,818 78. A fine brick cistern, holding 35,000 gallons,

has been built to catch the rain from the slate roofs, and thus supply the laundry with soft water. The saving in soap and soda will pay a good interest on the investment of \$785 93. Something over \$1,500 has been expended in the way of improvement of the grounds. Much grading has been done, and stone terraces have been constructed from the refuse material of the old building. There is still much to be done in this direction before the beautifying of the grounds is complete.

Two years ago the need of additional water became so urgent that the Board determined, under the advice of Mr. Schussler, Engineer of the Spring Valley Water Company, to drive a tunnel into the hillside above the spring which has heretofore supplied the Institution. Month after month the work was continued, in the hope of striking a permanent stream; but after going 508 feet, and expending \$1,729 15, it was deemed best to discontinue the work. The failure of the tunnel leaves the question of water supply unanswered. That something must be done in this direction is very evident. A family of one hundred and seventy people cannot be kept together in health and comfort without water, and a good deal of it. The garden needs a large quantity, if summer vegetables are to be supplied the table. The closets, baths, and laundry require water without stint; but for these purposes any ordinary surface or catchment water will do. The spring belonging to the Institution is unusually pure, and so situated as to be beyond the possibility of contamination. This water should therefore be kept for ordinary drinking and culinary purposes, and is ample for these uses. Wells may be sunk for the garden irrigation, and catchment water from the cañons to the rear of the Institution may serve the laundry and baths; but whatever is done should be done with a view to permanency and a supply of not less than 20,000 gallons per day.

NEEDED APPROPRIATIONS.

It is hoped that the coming Legislature will make proper provision for continuing the building operations, and thus enable the Directors to carry out the system they have begun to something near completeness. To this end it will be necessary to ask for an appropriation of \$148,000, to be expended as follows:

For an additional "Home"	\$51,500 00
To complete the dining-room, with the gymnasium beneath	13,500 00
For the educational building	70,000 00
For increasing water supply	5,000 00
For improvement of grounds	5,000 00
For putting brick foundations under shop building	3,000 00
Total	\$148,000 00

There has never been a time when the construction of a needed State work would be of more benefit in the way of giving employment than now, and while the tax on property would be very small, the help to the laboring classes would be very great.

I have referred heretofore to the necessity of a larger appropriation in case the borrowed money is not repaid to the General Fund. Before the meeting of the Legislature we shall have probably 140 pupils, and within the next fiscal year 150, to feed, care for, and educate. Heretofore the annual sum set apart for this work has been

\$36,000, but hereafter not less than \$40,000 will be required for the efficient conduct of the Institution.

ACKNOWLEDGMENTS.

Many of our pupils are under obligation to the management of the Central Pacific Railroad Company for reduced rates or passes to and from their homes. But for this kindness some pupils would have to forego the pleasure of vacation at home and with friends.

I desire also to again call the attention of the Board to the generosity of Dr. R. E. Cole, of Oakland, who for so many years has given his skillful services in dentistry to the pupils whose parents were not able to pay.

The following papers have been received at the Institution for the use of the pupils, and thanks are hereby tendered: Daily Examiner and Pacific Rural Press, San Francisco, California; Deaf-Mute Advance, Jacksonville, Illinois; Independent, Mexico, New York; Kentucky Deaf-Mute, Danville, Kentucky; Chronicle, Columbus, Ohio; Index, Colorado; Monthly Pelican, Baton Rouge, Louisiana; Mirror, Flint, Michigan; Goodson Gazette, Stanton, Virginia.

My personal thanks are due to the Directors for uniform kindness and consideration. Your coöperation has done much to lighten the labors and duties of my position, while your mature judgment and prudence have always helped, never hampered, my official action.

Respectfully submitted.

WARRING WILKINSON,
Principal.

Institution for the Deaf and Dumb, and the Blind, }
Berkeley, October 5th, 1879. }

PRINCIPAL'S DISSECTIONS OF CURRENT EXPENSES FOR TWENTY-FOUR MONTHS
ENDING JUNE 30TH, 1879.

Groceries and Provisions.

Ammonia, 10 pounds.....	\$3 50
Bacon, 282 pounds.....	36 18
Bath-brick, 2 dozen.....	1 30
Beans, 1,541 pounds.....	55 15
Bread.....	112 46
Buckwheat, 2,350 pounds.....	109 64
Butter, 6,454 pounds.....	1,835 08
Canned beef, 216 pounds.....	33 20
Canned lobster, 6 dozen.....	16 80
Canned oysters and clams, 8 dozen.....	23 00
Canned pork and beans, 2 dozen.....	4 50
Canned salmon, 6 dozen.....	18 35
Capers, 3 dozen.....	7 00
Cheese, 1,188 pounds.....	195 98
Cider, 5 gallons.....	4 00
Citron, 15 pounds.....	4 40
Coffee, 2,371 pounds.....	444 08
Cooking wine and brandy.....	23 00
Corn-starch, 40 pounds.....	4 40
Crackers, 1,437 pounds.....	72 69
Cracked wheat, 928 pounds.....	41 24
Cranberries, 2 barrels.....	27 00
Cream Tartar, 80 pounds.....	26 10
Extracts, assorted, 5 dozen.....	15 92
Fish, fresh.....	41 90
Fish, salt, 912 pounds.....	86 95
Flour, 281 barrels.....	1,668 78
Fruit.....	315 43
Fruit, dried, 2,341 pounds.....	233 74
Gelatine, 26 packets.....	4 50
Ham, 784 pounds.....	109 25
Hominy, 600 pounds.....	25 76
Hops, 23 pounds.....	4 85
Herbs, dried.....	75
Hulled corn, 29 gallons.....	8 85
Ice.....	37 19
Ice cream.....	16 50
Isinglass.....	1 00
Lard, 1,875 pounds.....	239 08
Lye.....	9 50
Macaroni, 8 boxes.....	11 60
Malt.....	2 60
Maple syrup.....	3 75
Meal, 1,505 pounds.....	57 00
Meat, 64,800 pounds.....	4,507 17
Mustard, 55 pounds.....	15 12
Nutmegs, 7 pounds.....	7 30
Pearl barley, 110 pounds.....	6 19
Pepper, 115 pounds.....	28 15
Pickles, 10 gallons.....	3 50
Potatoes and other vegetables, 46,049 pounds.....	842 24
Poultry.....	152 42
Rice, 1,050 pounds.....	74 74
Salad oil, 10 dozen.....	66 75
Saleratus, 96 pounds.....	5 91
Sal soda, 2,762 pounds.....	61 37
Salt, dairy, 2,150 pounds.....	20 45
Salt, pickling, 1,980 pounds.....	14 12
Saltpeter, 10 pounds.....	2 26
Sauce, 81½ dozen.....	38 00
Sapolio, 7 dozen.....	8 20
Sealing wax.....	75

Amount carried forward..... \$11,848 59

Amount brought forward	\$11,848 59	
Soap, brown, 2,797 pounds	182 59	
Soap, castile, 582 pounds	91 33	
Soap, toilet	5 25	
Soda, carbonate, 36 pounds	2 25	
Spices	81 24	
Split peas, 75 pounds	3 88	
Sugar, brown, 9,785 pounds	892 88	
Sugar, crushed, 2,906 pounds	342 74	
Sugar, powdered, 570 pounds	72 15	
Syrup, 566 gallons	307 39	
Tea, 667 pounds	255 65	
Vernicelli, 4 boxes	6 00	
Vinegar, 157 gallons	40 83	
Yeast and yeast powders	20 75	
		\$14,153 52

Salaries and wages.

Principal and teachers	\$19,709 10	
Physician, clerk, and matron	4,606 58	
Servants and services	7,220 47	
Gardener, watchman, and laborers	2,224 80	
		33,760 95

Clothing.

Bark	\$1 50	
Boots and shoes, 15 $\frac{1}{2}$ dozen	347 25	
Button plyers, 1 pair	1 25	
Blackening and brushes	20 74	
Buttons, needles, pins, and trimmings	40 13	
Calico, 72 yards	8 21	
Cambrie, 27 yards	3 18	
Cashmere, 13 yards	12 12	
Clothes brushes, $\frac{1}{2}$ dozen	1 50	
Collars (paper), 180 dozen	25 85	
Combs	8 88	
Cotton, 14 dozen	10 20	
Drawers, 2 $\frac{1}{2}$ dozen	11 25	
Dressmaking	36 05	
Elastic	3 90	
Flannel, 10 yards	4 70	
Handkerchiefs, 17 $\frac{1}{2}$ dozen	30 63	
Hats, 3 $\frac{3}{4}$ dozen	36 50	
Hair brushes, 1 $\frac{1}{2}$ dozen	5 75	
Hooks and eyes	50	
Hose, 13 $\frac{1}{2}$ dozen	36 68	
Knitting cotton and yarn	7 40	
Leather and findings	244 62	
Machine needles	1 25	
Machine oil	25	
Marking ink, 1 dozen	2 00	
Merino, 2 yards	2 50	
Merino shirts, 1 dozen	4 50	
Miscellaneous dress goods, 45 yards	11 50	
Muslin, 69 yards	9 22	
Nainsook, 9 yards	4 50	
Nail brushes, $\frac{1}{2}$ dozen	2 50	
Neckties, 4 $\frac{2}{3}$ dozen	10 25	
Pants, 17 pairs	92 50	
Repairing boots and shoes	142 25	
Ribbon	9 20	
Rubber cloaks, 10	44 50	
Rubber overshoes, 4 dozen	22 00	
Scissors	1 00	
Sewing silk	1 35	
Shawls, 1 dozen	15 63	
Shirts, check, 1 $\frac{1}{2}$ dozen	12 00	
Shirts, white, 4 $\frac{1}{2}$ dozen	47 05	
Silesia	4 67	
Skirts, 2	1 75	
Suits, 46	535 00	
Amount carried forward	\$1,876 16	\$47,914 47

Amount brought forward.....	\$1,876 16	\$47,914 47
Suspenders, 5 dozen.....	14 75	
Tape, 4 dozen.....	1 30	
Tarleton, 80 yards.....	17 43	
Thread.....	16 83	
Tooth brushes, 4 dozen.....	7 88	
Vests.....	4 00	
Wages, foreman shoe shop.....	311 00	
Worsted.....	11 00	

2,260 35

Furniture.

Bed screws, $\frac{1}{4}$ gross.....	1 50
Bell.....	1 75
Blankets, 3 pairs.....	18 00
Brooms, corn, 22 dozen.....	80 75
Brooms, hair, $\frac{1}{2}$ dozen.....	9 00
Brooms, wisp, 2 dozen.....	4 75
Candlesticks.....	35
Carpets.....	69 92
Carpet cleaning.....	60 08
Castors.....	11 80
Chairs, $21\frac{1}{2}$ dozen.....	52 00
Chintz, 10 yards.....	5 00
Clock tablets.....	3 75
Cotton mops.....	16 75
Crockery and glassware.....	141 76
Cutlery and plated ware.....	95 75
Curtains, lace, 4.....	15 00
Door mats, $\frac{1}{2}$ dozen.....	13 50
Dusting brushes, 3 dozen.....	14 00
Dust pans.....	5 00
Feather dusters.....	33 28
Feather pillows, 17.....	43 65
Furniture print, 51 yards.....	15 30
Furniture varnish.....	50
Kitchen hardware and furniture.....	47 28
Lamps and chimneys.....	69 40
Looking-glasses.....	9 00
Mattresses, 19.....	154 80
Mop handles, $\frac{1}{2}$ dozen.....	1 50
Mosquito net.....	1 08
Napkins, 9 dozen.....	23 25
Pails, 3 dozen.....	10 30
Picture knobs and cord.....	3 37
Plumbing tools.....	16 30
Preserve jars and cans.....	56 35
Picking hair.....	7 20
Quilts, 2 dozen.....	28 00
Range plate.....	12 95
Scrubbing brushes, 4 dozen.....	16 00
Sheeting, 375 yards.....	67 43
Spring beds and repairs.....	18 50
Stools, 3 dozen.....	17 00
Stoves.....	17 00
Table.....	11 00
Table linen, 31 yards.....	40 50
Ticking.....	8 04
Tidies.....	3 80
Tinware and repairs.....	83 65
Towels, 9 dozen.....	28 75
Toweling, 260 yards.....	36 32
Towel rack.....	1 50
Upholstery trimmings, etc.....	15 75
Urns, 2.....	10 00
Walnut, 175 feet.....	24 20
Window shades, 26.....	52 80
Wire cloth, 119 feet.....	7 65

1,613 81

Amount carried forward..... \$51,788 63

Amount brought forward..... \$51,788 63

Building and Repairs.

Copper wire, 1½ pounds.....	\$0 75
Door springs.....	6 55
Foot scrapers.....	60
Furnace door.....	9 50
Glass and putty.....	55 11
Glue and pot.....	6 25
Grate bars.....	3 50
Jenning closet.....	50 00
Laths and nails.....	10 37
Lime, 3 barrels.....	5 25
Locks and hinges.....	12 90
Lumber, 10,754 feet.....	283 76
Paints, oils, and brushes.....	61 25
Packing.....	4 55
Plumber's supplies.....	4 00
Plumbing, steam, and gas fitting.....	20 00
Red lead.....	1 00
Repairs to bakery.....	12 00
Repairs to mantel.....	6 15
Repairs to porch.....	8 94
Sashes.....	1 25
Sash cord.....	4 25
Shingles, 5,000.....	10 50
Stove top.....	7 50
Tin, 6 pounds.....	75
Varnish.....	6 40
Wages of carpenter.....	236 62
Whitewashing.....	125 75
Zinc.....	1 75

957 20

Fuel and Light.

Burners.....	\$1 05
Candles, 95 pounds.....	14 35
Coal, 209½ tons.....	2,486 48
Coal oil, 305 gallons.....	127 50
Freight, hauling and weighing gasoline.....	77 44
Gas lighter and tapers.....	6 85
Gasoline, 5,293 gallons.....	1,524 88
Lamp-wicks.....	5 80
Lard oil, 1 gallon.....	1 25
Matches, 15 gross.....	26 25
Repairing generator.....	18 40
Wages of engineer.....	1,095 00

5,385 25

Stable and Dairy Account.

Axle grease.....	\$0 25
Baling hay.....	63 00
Barley, ground, 5½ tons.....	160 95
Bran, 13½ tons.....	289 52
Broom.....	75
Chamois skins.....	1 50
Cracked corn, 6,063 pounds.....	128 33
Curry-combs and brushes.....	4 15
Dump cart.....	27 00
Egg food.....	50
Eggs for breeding.....	3 00
Harness and repairs.....	31 00
Harness oil.....	4 00
Hay, 50½ tons.....	528 37
Lantern.....	1 50
Lap blanket.....	2 00
Oats, 61½ tons.....	250 78
Oil meal, 2,567 pounds.....	43 14
Repairs to wagon.....	11 75
Rope.....	1 50

Amount carried forward..... \$1,552 99 \$58,131 08

Amount brought forward	\$1,552 99	\$88,131 08
Services of stallion and bull	46 00	
Sponge	1 25	
Straw, 16 bales	13 40	
Use of rake	1 00	
Wages of stableman and dairyman	1,400 00	
Whip	2 50	
		3,017 14
<i>Laundry.</i>		
Baskets and repairs	\$24 00	
Bluing, 95 pounds	36 25	
Borax, 10 pounds	1 43	
Bowls	60	
Brushes, 4 dozen	7 50	
Clothes line	1 00	
Clothes pins, 2 boxes	2 25	
Lard oil, 1 gallon	1 50	
Sal soda, 3,211 pounds	71 44	
Soap, 4,229 pounds	287 30	
Starch, 858 pounds	81 30	
Wages	1,927 50	
Wax	4 25	
Washboards, $\frac{1}{2}$ dozen	1 25	
		2,447 57
<i>Miscellaneous.</i>		
Advertising	\$1 55	
Bale rope	17 92	
Barrow	3 50	
Benzine	2 05	
Binding music and books	6 25	
Blacksmithing	219 55	
Books, stationery, school apparatus, and supplies	779 08	
Buggy	300 00	
Cartage and wharfage	61 76	
Carriage hire	5 00	
Carving tools	102 00	
Cash box	3 50	
Car tickets	11 10	
Cash to pupils	29 55	
Chamois skin	50	
Christmas expenses	78 85	
Closet paper	53 96	
Convention assessment and reports	12 00	
Cutting hay and wheat	12 50	
Die	2 50	
Diploma cases, 1 dozen	3 00	
Expense of clerk to city	3 75	
Expense of pupils returning to and from school	40 25	
Expense of pupils to concert, fair, etc.	9 45	
Expense of entertaining legislative committee	18 75	
Expenses to Sacramento	92 35	
Expense of boarding pupils	35 00	
Express charges	156 60	
Fares	150 85	
Farm and garden implements	80 88	
Flower pots	7 50	
Fly paper	5 00	
Freight on supplies	163 74	
Fruit, shade, and ornamental trees	25 25	
Funeral expenses pupil Walrod	15 00	
Glazier's diamond	6 50	
Gold leaf	1 60	
Hair cutting	25	
Hardware	165 57	
Honor rolls	40 00	
Horse-keeping	64 00	
Hose, nozzle, and sprinkler	13 75	
Hose stand	6 00	
Insect powder	35	
Iron clamps	1 65	
Amount carried forward	\$2,810 13	\$63,595 79

Amount brought forward	\$2,810 13	\$63,595 79
Kindergarten material	14 68	
Mail-bag and padlock	7 25	
Maple and other woods for carving	33 31	
Medicines and drugs	216 50	
Mouse traps	75	
Music	22 51	
Picks and shovels	11 85	
Plank walk	20 00	
Plumbing tools	34 85	
Postage stamps and rent of Post-office box	149 40	
Printing	11 25	
Repairing and tuning musical instruments	32 50	
Repairing carriage and buggy	140 75	
Scroll saw	29 35	
Seal of Institution	20 00	
Seed oats and wheat, 1,470 pounds	40 46	
Seeds and plants	26 97	
Shellac	1 15	
Silicon	4 00	
Squirrel and other poisons	17 65	
Stove polish	63	
Subscription to deaf and dumb annals	67 00	
Surveying	76 00	
Telegrams	72 96	
Tools for cabinet shop	8 35	
Threshing wheat	33 98	
Thermometers	1 88	
Toilet articles	40	
Type-writers	145 00	
Twine	2 38	
Use of picnic grounds	8 50	
Vaccination points	2 00	
Wrappers	5 55	
Water, 87,500 gallons	35 00	
Wheat sacks	11 52	
<i>Office Expenses.</i>		4,116 49
Carriage hire	113 00	
Cemetery	59 25	
Collection charges	96 25	
Printing and stationery	9 25	
Treasurer's salary	1,000 00	1,277 75
Total		\$68,990 03

EXPENDITURES FOR IMPROVEMENTS.

Fitting and Furnishing New Buildings.

Bedsteads	\$65 55
Blankets, 50 pairs	261 25
Bricks	15 00
Brass wire	34 31
Carpets	380 18
Clocks, 2	25 00
Coat and hat hooks	25 65
Crash, 300 yards	38 96
Coal hods, 9	6 75
Door springs, 1½ dozen	4 50
Draw pulls, 1 gross	7 00
Electric bells, 2	100 00
Frosting windows	9 50
Furniture	1,882 78
Fire irons, 6 sets	7 50
Hardware, miscellaneous	30 35
Locks	2 50
Looking-glasses, 12	18 00
Amount carried forward	\$2,914 78

Amount brought forward	\$2,914 78	
Lumber	274 70	
Oiling buildings	475 00	
Oil-cloth	76 56	
Pianos, 2	800 00	
Quilts, 36	40 50	
Sheeting, 950 yards	123 65	
Tassel hooks, $\frac{1}{2}$ gross	5 00	
Telephones	57 50	
Towel rollers	12 00	
Turkey red, 85 yards	20 10	
Wages of carpenter	225 65	
Water-heaters, 2	220 00	
Wire screens, 2	16 00	
		\$5,261 44
<i>New Laundry.</i>		
Asphaltum, 2 gallons	\$3 00	
Boiler plate	8 80	
Bricks	131 00	
Cement	14 00	
Carpenter work	126 45	
Elevator	150 00	
Engine, boiler, pump, and shafting	2,100 00	
Fire bricks, 200	20 00	
Fire clay	1 00	
Freight, etc.	9 40	
Hardware, miscellaneous	70 01	
Lead	1 25	
Leather belting	40 66	
Lime, 9 barrels	18 00	
Lumber,	204 73	
Mill work	1 50	
Oil, 7 gallons	9 00	
Packing	2 60	
Paint	6 00	
Pipe and fittings	164 33	
Sand, 9 tons	11 25	
Sewer pipe	5 60	
Stove pipe	5 40	
Tank	100 00	
Turpentine	65	
Washing machine	392 20	
Waste, cotton	6 50	
Wringer	350 00	
		\$3,953 33
<i>Water, Gas, and Sewer.</i>		
Cartage and wharfage	\$5 75	
Gas fixtures	258 89	
Gas machine and fittings	1,733 85	
Labor	214 50	
Lead	7 42	
Lime and cement	19 75	
Locks and hinges	3 10	
Lumber, 1,562 feet	28 12	
Pipe and fittings	1,359 62	
Sewer pipe	163 68	
Slop hopper	3 10	
Solder pot	1 00	
Water gate	20 00	
		3,818 78
<i>Tunnel.</i>		
Cartage	\$0 75	
Candles, 150 pounds	22 40	
Dump car	50 00	
Labor	1,441 25	
Lumber	75 60	
Powder and fuse	75 65	
Sharpening tools	37 50	
Tools	26 00	
		1,729 15
Amount carried forward		\$14,762 70

Amount brought forward ----- \$14,762 70

Cistern.

Bricks, 24,483 -----	\$318 29	
Cement, 60 barrels -----	180 00	
Hauling -----	34 00	
Labor -----	195 30	
Lime, 25 barrels -----	37 50	
Lumber -----	10 50	
Man-hole -----	6 59	
Sand -----	3 75	
		785 93

Improvement of Grounds.

Implements -----	\$6 40	
Labor -----	1,241 46	
Lumber, 6,898 feet -----	116 77	
Pipe and fittings -----	87 98	
Trees -----	15 00	
		1,467 61
		\$17,016 24

TREASURER'S STATEMENT OF RECEIPTS AND DISBURSEMENTS.

GENERAL FUND.

Receipts.

June 30, 1877—Amount of cash on hand		\$11,551 29
Received from State treasury on appropriation for support	\$72,000 00	
Received from Principal, from pupils, and miscellaneous sources	4,401 56	
		<u>76,401 56</u>
Total receipts		\$87,952 85

Disbursements.

For salaries and wages	\$38,590 95	
Supplies	29,121 33	
Treasurer's salary	1,000 00	
Directors' expenses	277 75	
	<u>\$68,990 03</u>	
Amount transferred to building fund	18,962 82	
		<u>\$87,952 85</u>

H. A. PALMER, Treasurer.

BUILDING AND IMPROVEMENT FUND.

Receipts.

From State treasury—Amount of appropriation 1875 for erection of new buildings	\$110,000 00	
Amount transferred from Shop and Improvement Fund	\$5,370 04	
Amount transferred from General Fund	18,962 82	
Amount advanced by Union Savings Bank	4,817 85	
		<u>28,650 71</u>
Total		<u>\$138,650 71</u>

Disbursements.

Contract for two Homes, W. E. Boone	\$84,500 00	
Superintendent's salary, N. R. Tucker	2,000 00	
Architects' fees, Wright & Sanders	4,225 00	
Discount on silver coin	261 00	
		<u>\$90,986 00</u>
Contract for refectory, laundry, and Principal's residence, A. J. McKee	\$27,150 00	
Superintendent's salary, N. R. Tucker	1,600 00	
Architects' fees, Wright & Sanders	1,357 50	
Discount on silver coin	9 00	
		<u>30,116 50</u>
General expenses:		
Advertising	\$354 47	
Rent	37 50	
Attorney's fees	140 00	
		<u>531 97</u>
Furnishing and fitting new buildings	\$5,261 44	
Machinery, etc., new boiler-house and laundry	3,953 33	
Gas-works, fixtures, etc., water and sewer pipes	3,818 78	
Tunnel	1,729 15	
Cistern	785 93	
Improvement of grounds	1,467 61	
		<u>17,016 24</u>
Total		<u>\$138,650 71</u>

H. A. PALMER, Treasurer.

LIST OF PUPILS IN THE INSTITUTION SINCE JULY 1ST, 1877.

NAMES.	Towns.	Counties.
<i>Deaf and Dumb—Males.</i>		
Aldersley, Lyell	Napa City	Napa.
Aronsohn, Martin	San Francisco	San Francisco.
Best, William C.	Suisun	Solano.
Black, Joseph French	Pleasanton	Alameda.
Bucking, George F.	San Francisco	San Francisco.
Butler, Louis L.	Halleck Station	Elko, Nevada.
Christeen Fredk. William	Sacramento	Sacramento.
Christensen, Lewis O.	Hollister	San Benito.
Cohn, Max	San Francisco	San Francisco.
Connelly, John	San Francisco	San Francisco.
Collischonn, Fred.	Oakland	Alameda.
Coulter, Charles B.	San Andreas	Calaveras.
Cushman, Ira D.	Georgetown	El Dorado.
DeWolf, Joseph	San Francisco	San Francisco.
Dickerson, Benjamin F.	Millville	Shasta.
Dobner, Harry	San Francisco	San Francisco.
Egan, William	San Francisco	San Francisco.
Funkenstein, Leon	San Francisco	San Francisco.
Gard, Peter	Brown's Valley	Yuba.
Gee, William E.	Gibsonville	Sierra.
Grady, Theodore	San Francisco	San Francisco.
Hannah, Andrew Milligan	San Francisco	San Francisco.
Harding, Josh G.	San Francisco	San Francisco.
Hill, Eldridge B.	Santa Barbara	Santa Barbara.
Holman, Willis G.	Linden	San Joaquin.
Lambert, Norman	Carpenteria	Santa Barbara.
Lewis, Beverley	Tracy	San Joaquin.
Lohmeyer, Edward W. F.	San Francisco	San Francisco.
Lynch, William Holden	Paicines	San Benito.
Mast, Herman X.	San Francisco	San Francisco.
McCabe, James	San Francisco	San Francisco.
McClure, William C.	Unionville	Humboldt, Nevada.
McCormick, Francis	Sonora	Tuolumne.
Moesser, George E.	Santa Ana	Los Angeles.
O'Brien, Daniel	San Francisco	San Francisco.
Oldham, William G.	Santa Rosa	Sonoma.
Olivas, Dolores	Santa Barbara	Santa Barbara.
O'Rourke, James P.	San Francisco	San Francisco.
Palmer, Lewis Arthur	Wilmington	Los Angeles.
Poyser, Harry	San Francisco	San Francisco.
Price, Edmund M.	Salinas City	Monterey.
Rahmstorf, George Henry	Midway Station	Alameda.
Raymond, Harry L.	Oakland	Alameda.
Redman, William W.	Willitsville	Mendocino.
Redmond, Grenville S.	San José	Santa Clara.
Reichsrath, Charles	West End	Alameda.
Rhorer, Joel N.	South Vallejo	Solano.
Rosenbaum, Nathan	San Francisco	San Francisco.
Saltenberger, George	San Francisco	San Francisco.
Schilling, William	San Francisco	San Francisco.
Schlam, Solomon	San Francisco	San Francisco.
Schleweck, Simon	San Francisco	San Francisco.
Schreiner, Henry	Freeport	Sacramento.
Selig, Kossuth	San Francisco	San Francisco.
Shattuck, Frank B.	San Francisco	San Francisco.
Shoaf, George Anton	Virginia City	Storey, Nevada.
Sievers, Charles	San Francisco	San Francisco.
Smith, Ellsworth	Riverside	San Bernardino.
Stewart, Francis F.	Wilmington	Los Angeles.
Sullivan, Torrence W.	San Francisco	San Francisco.
Taber, Henry W.	Gibsonville	Sierra.

LIST OF PUPILS—Continued.

NAMES.	TOWNS.	Counties.
Tilden, Douglas	San Francisco	San Francisco.
Williams, Leo	San Francisco	San Francisco.
Willitts, Joshua M.	Carson City	Ormsby, Nevada.
Winslow, William H.	Oakland	Alameda.
Wood, Benjamin M.	Springville	Ventura.
Wood, Edgar	Woodville	Tulare.
Wright, Albert H.	Oakland	Alameda.
<i>Deaf and Dumb—Females.</i>		
Aronsohn, Caroline	San Francisco	San Francisco.
Awbrey, Eliza Bell	Red Bluff	Tehama.
Ayers, Dora	Stoney Point	Sonoma.
Bartels, Laura A.	Oakland	Alameda.
Boothe, Meta M.	Pope Valley	Napa.
Botto, Orelia	Sutter Creek	Amador.
Bradley, Arrenia	Lewiston	Trinity.
Bradley, Catherine	Lewiston	Trinity.
Cronin, Ellen	San Francisco	San Francisco.
Darling, Sarah F. J.	Bear Valley	Mariposa.
Decker, Delia	Chico	Butte.
Defrees, Mary Alice	Sacramento	Sacramento.
Deguoy, Margueritte	Saint Helena	Sonoma.
Doren, Theresa	San Pablo	Contra Costa.
Durkee, Mary Louisa	San Francisco	San Francisco.
Emry, Frances Ellen	Chico	Butte.
Foland, Katie May	San Juan	San Benito.
Ford, Catherine	San Francisco	San Francisco.
Funkenstein, Paulina	San Francisco	San Francisco.
Gilbert, Angele	San Francisco	San Francisco.
Goss, Nancy Jane	Downey City	Los Angeles.
Halloran, Maggie	Bird's Landing	Solano.
Kuffell, Wilina E.	Bloomfield	Sonoma.
Lewis, Josephine	Tracy	San Joaquin.
Lucas, Maggie	Woodland	Yolo.
Madigann, Emma Jane	Mayfield	Santa Clara.
McLaughlin, Sophie	San Rafael	San Rafael.
McTigue, Augusta	San Francisco	San Francisco.
Munson, Mary Elizabeth	Eureka	Humboldt.
Peralta, Mary	Wickenburgh	Arizona.
Porter, Fannie E.	Turlock	Stanislaus.
Prout, Fanny E.	The Dalles	Oregon.
Roesler, Annie K.	San Francisco	San Francisco.
Ross, Nellie	Napa City	Napa.
Schietz, Mathilda	Los Angeles	Los Angeles.
Sieferman, Louisa	Woodland	Yolo.
Sieferman, Emilie	Woodland	Yolo.
Sisterna, Juanita	West Berkeley	Alameda.
Thorpe, Charlotte C.	San José	Santa Clara.
Uhl, Anna M.	San Francisco	San Francisco.
Warren, Annie	Wilmington	Los Angeles.
Wallace, Gertrude Janet	San Francisco	San Francisco.
Wright, Honorah Catherine	San Francisco	San Francisco.
<i>Blind—Males.</i>		
Andrews, Luke	Woodland	Yolo.
Butterfield, Alonzo	Sacramento	Sacramento.
Calvert, George	San Francisco	San Francisco.
Catoir, Jacob	San Francisco	San Francisco.
Damewood, William	San Francisco	San Francisco.
Dodds, Orrin	San Francisco	San Francisco.
Durham, John Oliver	San Francisco	San Francisco.
Foley, Dennis	San Francisco	San Francisco.
Hodgson, Joseph	Sherlock	Mariposa.
Jackson, Stephen	San Francisco	San Francisco.
Knoblock, Charles	San Francisco	San Francisco.
Lerch, Charles	San Francisco	San Francisco.

LIST OF PUPILS—Continued.

NAMES.	Towns.	Counties.
Loucks, Gideon L.	Santa Rosa	Sonoma.
Martin, Clement P.	Vallejo	Solano.
Moore, John T.	San Francisco	San Francisco.
Nagle, Harry M.	Oakland	Alameda.
Orth, Louis	Sacramento	Sacramento.
Otero, Ehudaldo	Phoenix	Arizona.
Staggs, William Amos	Denver	Solano.
Towle, William Henry	San José	Santa Clara.
Weider, Daniel, Jr.	Oakland	Alameda.
<i>Blind—Females.</i>		
Aitken, Maggie	Benicia Arsenal	Solano.
Alderson, Clara C.	Oroville	Butte.
Clement, Catherine	San Francisco	San Francisco.
Dalton, Nellie A.	Vallejo	Solano.
Fennel, Anna	San Francisco	San Francisco.
Haney, Louise	Bath	Placer.
Harden, Nannie	Petaluma	Sonoma.
Maloney, Catherine P.	Oakland	Alameda.
Mast, Emma L.	San Francisco	San Francisco.
Morrison, Margaret E.	Oakland	Alameda.
Morton, Lulie	Grangeville	Tulare.
Penny, Ada	San José	Santa Clara.
Perrot, Ella	Sacramento	Sacramento.
Tenney, Mary Anne	San Francisco	San Francisco.
Walrod, Flora Eleanor	Stockton	San Joaquin.

TERMS OF ADMISSION.

The California State Institution for the Deaf and Dumb and the Blind is located at Berkeley, about four miles north of the City of Oakland. Between San Francisco and Oakland a steam ferry plies almost every half hour in the day, and from the latter city a horse railroad is constructed, which lands passengers within easy walking distance of the Institution.

First—The Institution offers its benefits to all deaf and dumb or blind persons who are of age suitable for instruction, and who are of sound intellect, and free from vicious habits, and contagious or offensive diseases.

Second—No charge is made for pupils from this State, except for clothing and traveling expenses.

Third—Pupils from other States or Territories are charged \$300 per annum, payable quarterly in advance. No deduction is made from annual charge, on any account, except in cases of prolonged sickness.

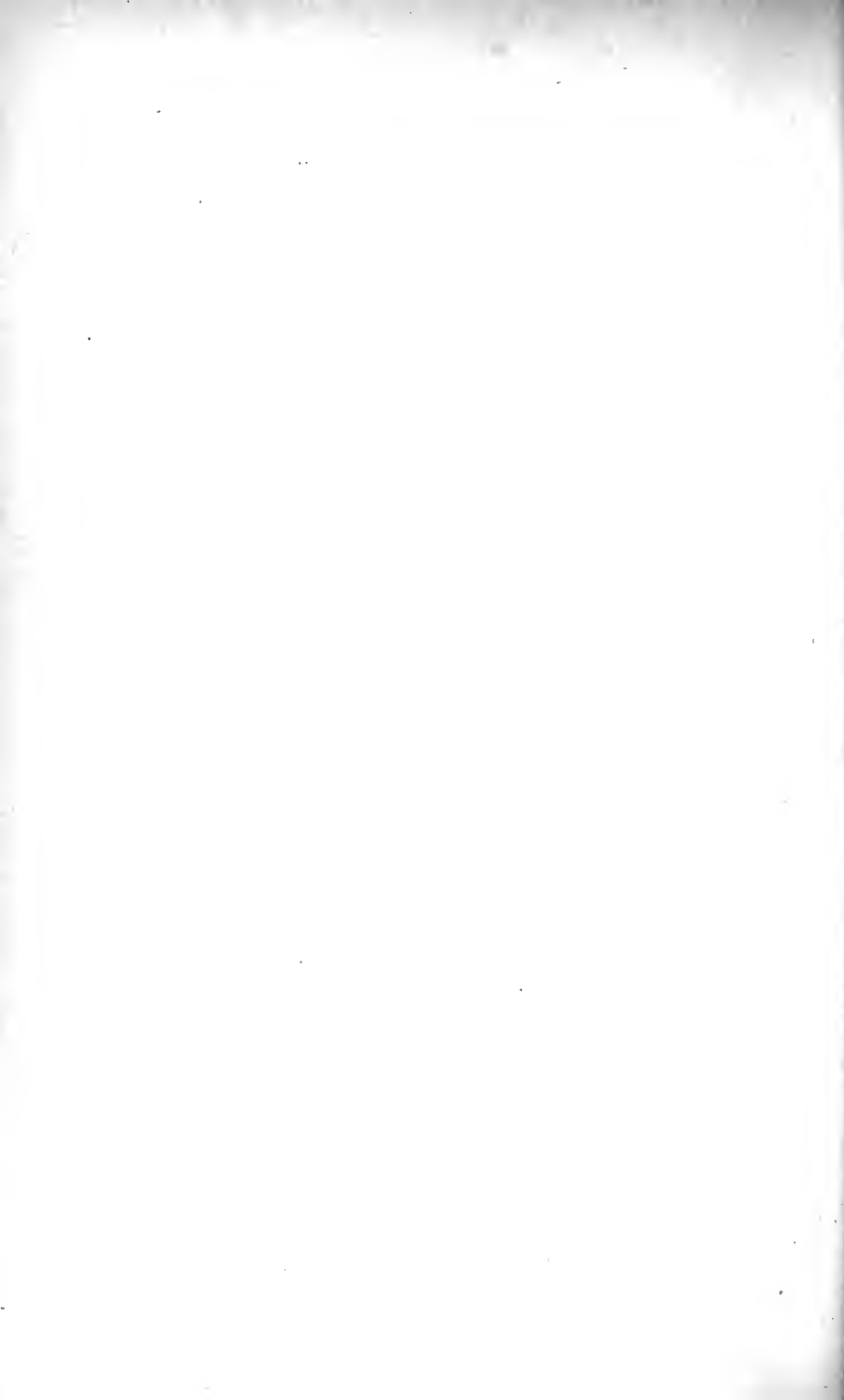
Fourth—The session begins on the fourth Wednesday of August, and closes the second Wednesday of June. Parents are earnestly requested to enter or return their children promptly at the beginning of the term. Only in extreme cases will the pupils be permitted to leave before school closes.

Fifth—Pupils should be provided with comfortable clothing when they enter the Institution, and their wardrobe renewed twice a year.

Sixth—All moneys designed for pupils should be placed in the hands of the Principal, to whom, also, all letters of inquiry, etc., should be addressed.

Parents or guardians of applicants for admission are requested to furnish written answers to the following questions:

1. What is the name of the applicant?
2. When and where was he born?
3. Is his deafness or blindness from birth; or is it from accident or disease? If so, at what age and from what cause did he become so?
4. Is his deafness or blindness total or partial? If the latter, what is the degree of hearing or sight?
5. Have any attempts been made to remove his deafness or blindness; and if so, what are the results?
6. Are there any other cases of deafness, blindness, insanity, or idiocy in the same family, or among the collateral branches of kindred? If so, how and when produced?
7. Was there any relation between parents or grand-parents before marriage?
8. Has the child had the small-pox, scarlet fever, measles, mumps, whooping-cough? Has he been vaccinated?
9. What are the names, nationality, occupation, residence, and post-office address of his parents?
10. What are the number and names of their children?





BIENNIAL REPORT

OF

THE BOARD OF DIRECTORS

OF THE

CALIFORNIA STATE PRISON,

COMMENCING

JULY 1ST, 1877, AND ENDING JUNE 30TH, 1879.

BOARD OF DIRECTORS OF THE CALIFORNIA STATE PRISON.

HIS EXCELLENCY, WILLIAM IRWIN,
Governor.

HONORABLE JAMES A. JOHNSON,
Lieutenant-Governor.

HONORABLE THOMAS BECK,
Secretary of State.

L. BARTLETT,
Clerk to the Board of Directors.

REPORT.

OFFICE OF THE BOARD OF STATE PRISON DIRECTORS, }
SAN QUENTIN, CALIFORNIA, July 1st, 1879. }

To His Excellency, William Irwin, Governor of California:

As required by law, we respectfully submit the following as the biennial report of the Resident Director of the California State Prison, embracing reports of the Clerk of the Board of Directors, Turnkey, Physician, and Moral Instructor. These reports show the working of the Prison in all details, from July 1st, 1877, to June 30th, 1879, (inclusive).

Very respectfully,

JAMES A. JOHNSON,
THOMAS BECK,
State Prison Directors.

REPORT

OF

THE RESIDENT DIRECTOR OF THE CALIFORNIA STATE PRISON.

To the Honorable Board of Directors of the California State Prison:

GENTLEMEN: I have the honor to present the biennial report of the Resident Director of the California State Prison, covering the time between the 1st day of July, 1877, and the 30th day of June, 1879, inclusive. You are respectfully referred to the reports of officers for detail of the matter therein exhibited, which particularly concerns the general running of the Prison and its present condition.

REMARKS.

Since my last biennial report many much needed improvements have been made, which will be mentioned hereafter under the appropriate heading and in detail. It is one of the favorable signs of the times that recently a great interest seems to have been awakened upon the subject of prison management in general. Public men and newspapers have shown an unusual interest in the matter of prison management and discipline, until, I believe, every known system has found warm and earnest advocates. Hence, a few words from me on the subject may be pardonable, not by way of defense of my own management, for in this regard I have nothing to boast of. I do point with some satisfaction, however, to the fact that we have made a great reduction in the running expenses of the Prison in the last two years. And for the quarter since July 1st of the present year, although not properly belonging to this report, we have made this the cheapest congregate Prison (except three) in the United States, the daily cost per capita being only 32 cents and 8 mills, as will be seen by reference to the proper table. With the system here in general I of course have had no power to deal, that depending in a great measure upon the style of the buildings and the number of prisoners. Still, we have made very many reforms in the last two years, and, but for a defection in the cell buildings and want of room, would have to-day exactly the present New York system. To enable us to adopt that system entirely we must have cell room sufficient to prevent the doubling up of prisoners. Each prisoner must have his separate cell, and the law must authorize his confinement therein for a time at least, with or without work, when he first enters, or at any other time for that matter, in the discretion of the management. The adoption of the new Constitution, which goes into effect on the 1st day of January, 1880, places the management under a permanent board of officers. This accords with the views I expressed in my last report, and will enable the Prisons of this State to be brought up

abreast with the best institutions of the kind in the United States. In fact, with a permanent Board of Directors and a permanent Warden, and a cell for each prisoner, there is no reason why this may not become a model institution. As soon as the Folsom Prison is opened, which may be at any time after the 1st of January next, a trifling outlay of money will prepare the necessary room to place each prisoner in a cell to himself. When we have accomplished so much, and inaugurated the new system, which we may do by transferring five hundred prisoners to the new Penitentiary at Folsom, ours may then rank among the highest and best institutions for the suppression of crime and the reformation of criminals. To show that our system will then be in harmony with the best prisons of the world, I deem it not out of place here to give a brief description of the prevailing systems in different countries; not that you, gentlemen, to whom this report is addressed need or require anything of the kind, for you have made this subject a study, but for the benefit of such members of the next Legislature as desire to take part in shaping the new system, and who, from their occupations in life, have been prevented from acquiring any knowledge upon the subject. Prison systems of the world, taken from the latest accessible reports and papers, are as follows:

AUSTRIA

Has several prisons, but as they are not all built alike, she necessarily has different systems; however, until quite recently, the associate system alone prevailed. But all the new prisons, built since 1867, have been arranged so as to be both cellular and associate, like ours. It is provided by law, that every two days passed in cellular confinement shall count as three days on the sentence, and that no prisoner shall serve more than three years in cellular confinement. Retired prison officers are pensioned by the government.

BELGIUM

Has eighteen prisons, mostly cellular, that system having the sanction of her ablest men. However, in the Belgium prisons, each prisoner is treated somewhat in accordance with his general character and deportment. Retired prison officers are pensioned by the government.

DENMARK

Has a mixed system of imprisonments, her jails being used largely for criminals guilty of the lighter offenses. All criminals sentenced to labor in the State Prison are not treated by the same rules under the same system. Those sentenced from two years to life are under what is here known as the Auburn system. There are four penitentiaries in Denmark, three on the congregated system and one on the cellular.

FRANCE

Has a great variety of penal institutions, but three of them corresponding to anything in this country. The central prisons, like our penitentiaries; the departmental, like our jails; institutions for correctional education, like our houses of correction and reform schools.

The cellular system is not in use, but the congregate. Pensions are paid to retired prison officers.

THE GERMAN EMPIRE

Has a mixed system of prisons. Baden, a department of the Empire, has a system partially congregate and partially cellular, but no prisoners can be separately confined for a longer time than three years. Upon retirement prison officers are pensioned.

BAVARIA

Has four cellular prisons, one for the punishment of criminals, the others for the safe-keeping of prisoners awaiting trial. All the other prisons of the Kingdom are on the congregate system. Retired officers are pensioned by the government. In

PRUSSIA

There are forty-seven prisons properly speaking, but one of which is organized on the cellular plan. The cellular system is new in Prussia, but it is claimed that no appreciable difference exists, so far as the reformation of criminals is concerned; but that other benefits may and do result from the cellular system which could never be attained by the congregate. The government pays pensions to retired prison officers. In

SAXONY,

Where the best results have been secured, the system is a mixed one. There each prisoner is treated to just what his case is supposed to require. He is treated under the cellular system, the congregate, made a trusty, or given a ticket of leave to spend a time with his friends and family, as the authorities think just to him and safe to the State. Saxony has eleven prisons where this system prevails, and with the best results. In

WURTEMBERG

The congregate system prevails, with common dormitories, except the prison at Heilbron, where a trial is about to be made of the cellular system. Generally throughout the German Empire the congregate system prevails.

ITALY,

Like Germany, has that diversity in prison system which naturally results from the combining of many sections under one rule. The Tuscan Provinces have the cellular system. I believe the Neapolitan, Sicilian, and others, have the Auburn system. The best reports are that the government is making efforts towards a unification of systems, but upon what plan I do not know. At the last report, the prisons of Italy were classed by Mr. Wines thus: Two on the system of isolation and partly association; five on the Auburn plan; two partly on the Auburn plan and partly on the community plan; and forty-five on the community system. Retired officers are paid pensions.

MEXICO

Has but few penitentiaries—all on the cellular system. All other prisons are on the plan of association. The

NETHERLANDS

Have a system of cellular and association, but no prisoner shall be confined in a cell longer than two years. Retired officers are paid pensions by the government.

NORWAY

Has a mixed system, partly associate and partly separate. Retired officers are pensioned by the government.

RUSSIA

Has a mixed system, but cellular imprisonment for long terms is forbidden by law. The system in Russia is supposed to be bad, and the management generally worse. Retired officers are pensioned by the government.

SWITZERLAND

Has mainly the Crofton or Irish system. The congregate system also prevails, but efforts are being made to adopt the cellular of nights. The report of Mr. Wines states: There is a general agreement that the system of association is favorable to industrial labor, and not unfavorable to discipline, but that when extended to the dormitories as well as the workshops it is obstructive to the moral education of the prisoners. Pensions are paid to retired officers by the government.

SWEDEN

Has a mixed system of prisons, cellular and congregate, but it is making efforts to adopt the Crofton plan. Sweden pays pensions to her retired prison officers.

In the American States, it is said our first steps were taken in the matter of prison reform in Philadelphia, in 1784, when the old Walnut Street Prison was built, and that the first organized effort was made in 1787 by Dr. Franklin and others. The oldest penitentiary is at Charlestown, Massachusetts, began in 1800 and completed for the reception of prisoners in 1805. Fifty years and more ago a heated controversy was carried on by some of our most distinguished statesmen of that time, as to the best system for penitentiaries. Two systems had strong and able advocates; one was called the Pennsylvania system, the other the New York system. The New York system adopted at Sing Sing and at Auburn was the congregate, with separate cells for prisoners at nights. The Pennsylvania system, adopted at Philadelphia and Pittsburg, was the cellular and isolation. Several other States adopted the Pennsylvania system, but all have now abandoned it, and in fact it has long since been abandoned at Pittsburg, so that the system now prevails in but one American prison, and but few in the world. The system has been condemned by every able and enlight-

ened statesman who has studied the subject, for the last twenty years, and has been finally abandoned in this country and in most all the nations of Europe.

The Crofton or Irish system commends itself generally to students and prison managers throughout the civilized nations. This is but a liberal trusty system. The next in rank, and in the main like it, is the New York system, now being adopted in all the new American prisons, where it can be done without too much cost. In my opinion, the New York system is free from many objections which may be urged against the Crofton. For instance, the free association of prisoners, which must take place at some stage of the imprisonment under that system, is certain to prove destructive of all the good and repressive effects of isolation. The most learned and laborious association for the prevention and cure of crime in the world—the Howard Association of England—has lately assailed that system, and not only denounced Spike Island but Mountjoy—Dublin Penitentiary—as well, for the reason, mainly, that a free association of prisoners is certain to breed plots and plans for mischief after discharge; and also, because such association begets a feeling of home attachment for the prison, to which the prisoner returns in many cases without regret. This sort of association here is doubtless the cause of hundreds of returns to the prison, and of course of the commission of hundreds of crimes. In a recent communication of a committee of the Howards to the Home Secretary I find these remarks: “The due separation of prisoners from each other only, is an essential feature of a wise and efficient treatment, but mere solitude is unnatural and pernicious. It is neither wise nor merciful. Prisoners, when separated from evil companionship, should be necessarily brought under the influence of good intercourse, both from within and without.” In this short paragraph lays the foundation of the best economy, the most humane treatment of convicts, and the best repressive and reformatory methods possible at any penitentiary. These principles may be carried out here, after the new prison is opened, and the number here reduced to 1,000, by an outlay not to exceed \$10,000 in enlarging the cell room.

Were I asked to suggest the very best plan for the prevention of crime, I would advise the closing of drinking-houses, and the absolute solitude of prisoners. But the freedom-loving citizen of this country will not be restricted in his right to buy, sell, and use alcoholic liquors, nor will the humanity of the age permit such brutalizing of the convict. Were I asked then to suggest a plan alike just to the public and to the convict, I would say keep the convict in a cell to himself, make him work, use every means to teach him the benefits of honesty and morality by placing him in contact with honest and moral people from within and from without. We should consider no man wholly and entirely bad, even though he be a convict, and that every man has within him a germ of goodness which is capable of illimitable expansion. In this age of advancement, when men of every other calling have reached to almost human perfection, it is strange that the moral and religious cultivation has made so little out of this seed of goodness, this germ of the godly principle in man! Whatever may be the cause of the fearful increase of crime now noticeable everywhere, it is anyhow a public duty we all owe to the State to save and cultivate all the good we find in and among

prisoners, and to this end we should use such methods as justice and humanity may dictate. We should not strain after original systems or violent remedies for the management of criminals or the repression of crime, but we should keep up with the spirit of the age, and thereby show ourselves as capable and as kind in these matters as any other people. I make these remarks because the agitation in the State over the question of prison reform, although good as indicating a proper interest in the subject, is liable to bring to the surface many radical reformers, who would, in their zeal for the protection of the public, entirely forget the claims of the unfortunate and the criminal. It is a curious fact that right in the home of prison reform, and in the center of our civilization where the question of prison reform has been most agitated, the number of convicted criminals in proportion to the population greatly exceeds that of any other part of our country. I allude to New York and Massachusetts. This proves one of two things, either that the teachings of our best moral codes are conducive of crime, or that too much agitation of the prison question is not good. For more than one hundred years this great question has been a constant theme of discourse by divines and by statesmen, and what has been accomplished? The religious sentiment has been steadily on the increase, civilization has been taking higher grounds, the moral sentiment of the world seems to have constantly improved, yet crime has in no sense been diminished. Since the days of John Howard, who gave the years of his life, between 1770 and 1790, for the relief of suffering criminals, and the improvement of prison life in England, there has been a constant increase of crime in all the Christian nations. Burke says of this great philanthropist: "He visited all Europe, not to survey the sumptuousness of palaces or the stateliness of temples; not to make accurate measurements of the remains of ancient grandeur, nor to form a scale of the curiosity of modern art; not to collect manuscripts, but to dive into the depths of dungeons; to plunge into the infection of hospitals; to survey the mansions of sorrow and pain; to take the dimensions of misery, depression, and contempt; to remember the forgotten; to attend the neglected; to visit the forsaken, and to compare the distress of all men in all countries." What a glorious cause he served! Yet it must be confessed that for the general good of the nations, the setting in motion of the humanitarian and philanthropic views of Howard, has brought nothing but bad fruit. The benefits have all been on the side of the criminal. The agitation once having been started, the subject being so full of tenderness and even grandeur, naturally enlisted the most eloquent divines and statesmen. So that fifty years ago the excitement seemed to have culminated. Commissions were almost everywhere raised to investigate the subject of prison reform. Commissioners were sent here from foreign countries, and our own greatest men of all classes set to work in investigating, writing, and speaking upon the subject. And this was natural, as long as the people were interested, for eloquence always selects man's wrongs, misfortunes, and abuses, as the best themes for riotous declamation. As long as this excitement kept up to fever heat crime increased in the country. Finally a lull came in the agitation, and with it a lagging of the increasing ^{severity} of crime. In 1872 the eloquence, and the charity, and the sentimentalism of the United States again broke out with intense violence upon the subject. They seemed to be, and they

were, determined to reform the prisoner, and prevent the commission of crime. All the nations of Christendom were seized with a spasm of intense brotherly love for the poor unfortunate criminal. They met in London in 1872, and their great divines and statesmen made speeches and wrote essays. Then, again, they met last year in Stockholm, and did it all over again, in the most fervent manner. All over the United States we have founded prison associations for the relief of the criminal, and we have held State and Federal Congresses for the same purpose, and what has it amounted to? It has made prison life easier—it has made it easy. It has made crime, as a career, quite respectable in the eyes of very many. It has more than doubled the criminal element of the Christian nations in the short space of seven years. It has more than trebled the number of convicts in some of our American States within that time. It has increased our number of convicts from 16,000 to about 35,000, and gives us over 60,000 criminals in the United States. The convict should be protected in all his rights as a convict, but it should never be forgotten for one moment that he has forfeited every other right, and he should never be permitted to forget those things. If there is ever to be any deterrent effect in the imprisonment of the convict it will be when the outside world looks upon him with loathing and with horror, and when the convict lives a life of humility and obedience, recognizing fully his loss, and that of the State, by his crime and imprisonment.

In concluding this part of my report I beg leave to summarize the foregoing. I would—

First—Give to each prisoner absolute seclusion of nights.

Second—Would confine him to his cell alone for at least a short time upon his arrival at the Prison, and would authorize his separate confinement at any time thereafter, in the discretion of the management, subject only to a reasonable restriction as to length of time.

Third—Would make him work when possible.

Fourth—Would give him free intercourse with the good, whether reformed prisoners or outsiders, but would prohibit general visitation as at present practised.

Fifth—Would encourage the “trusty” system by the constant advancement of good and reliable prisoners, and would carry it to the full extent, in rare and important cases, of allowing prisoners to leave the Prison and visit their friends and relations.

Sixth—Would have as near silence as possible in marching, in the dining-room, and in the workshops; but prisoners should at all times be allowed to make known their grievances.

Seventh—Would continue the “Goodwin” or good “Copper” bill.

Eighth—Would advise the Legislature to devise some plan for the equalization of sentences.

Ninth—Would use the pardoning power ten times to where it is now used once; would not use it absolutely, but conditionally. The Governor may impose any condition he pleases; he may confine one man to the limits of a particular town; another to a particular township; another to a county, or to a farm, or he may send him out of the State or the United States, or he may pardon him upon condition that he pay a sum of money for the support of the Prison, or that he furnish beef for the Prison for a given time.

There are at least one hundred prisoners here who ought, in my

judgment, to be pardoned, and there are at least two hundred more serving excessive, unheard of, and inhuman sentences. Then, again, there are at least two hundred prisoners here, under short sentences, who should either have been sent for life or long terms.

OFFICIAL FORCE.

As will be seen by reference to the Clerk's Table, giving list and rank of officers, we have been compelled to make an increase of five in the guard force. This was made necessary by the increased number of prisoners, and the extra hazard of working a large gang of men on the hills some distance from the Prison. We found it absolutely necessary to employ a competent Book-keeper as Assistant Commissary, or Commissary's Clerk, and also to appoint a Moral Instructor. Of the force in general too much cannot be said in their praise for watchfulness and uniform fidelity to their trusts. The officers, one and all, have been true and devoted, and are entitled to the highest commendation for their fidelity to the service.

THE BRICK-YARD.

The making of brick has not been carried on this season, and never can be again, unless land is purchased in the neighborhood from which the requisite quality of clay can be obtained. Since my last report we have made about 6,500,000 brick, to which should be added 2,000,000 on hand at the end of the burning season of 1877, making 8,500,000. The cost of the two burning seasons, 1877 and 1878, have to be taken together from July 1st, 1877, making a total, mostly for fuel, of \$24,401 25, as may be seen by reference to Table Fifteen. By reference to Table Thirteen, it will be seen that the income from the sale of brick amounted to \$18,101 16. There are yet owing to the State several uncollected balances for the sale of brick; all of which I hope to collect before my term of office expires. It will be impossible to give anything more than an approximate estimate of the brick used here in the various buildings, and other improvements. Relying upon the best method of computation, it being impossible, the way the buildings and improvements were made, to keep an exact account, I estimate the number of brick used at 4,000,000. We have on hand about 1,500,000, perhaps more. The balance have been sold, mostly for \$7 per 1,000; some, however, at \$7 25 per 1,000.

BUILDINGS AND OTHER IMPROVEMENTS.

That a full and complete understanding may be had on the subject, the Clerk has retabulated that part of our last report coming under the head of "Building Fund Expenditures." To this we place, in tabulated form, our expenditures for other buildings since constructed. The recapitulation, marked "Table One," of buildings, shows that we have expended \$212,509 25 for all buildings, and what they are. "Table Two," of buildings, specifies in detail the expenditures. From these tables it will be seen that we have used \$12,506 25 from the General Fund, for these absolutely necessary buildings. Since the last report, we have put up a cell-building, containing two hundred and four iron cells, at a cost of \$41,219 93. The items of cost will be found specified in "Table Two," above mentioned. We

have also erected a building for library, school-room, and chapel, two shop-rooms, kitchen, and dining-room, all in one, at a cost of \$10,-412 92. The part of the building used as a dining-room is about three hundred feet long, forty feet wide, and one story high. The other part of the building used for kitchen, shop-rooms, chapel, library, and school-room, is about eighty feet long, forty feet wide, and three stories high. We have also erected a building for a Clerk's office and store-room, at a cost of \$4,582 74, which is two stories high, and about forty feet square. We have also erected a drying-house next to the boiler-building, forty feet long, twenty feet wide, and one story high; also, an addition to the boiler-house for the storage of fuel, about thirty feet square, and one story high; also, a small building one story high, thirty by twenty feet, at the lower door of the north shop, for the use of heavy machines. The cost of these last buildings have gone into the "General Improvement Account," as there was but little new material, other than brick, lime, and sand, used in their construction. In addition to these improvements, the hill in front of the commissary department, and looking down towards the front gate from the guns, has been cut down, and a heavy brick wall has been erected at the foot, and a terrace-wall on top of the hill. This summer we have built, or rather excavated, a large reservoir on the top of the hill, north of the Prison. It is about 200 feet above or higher than the lower floor of the shop-buildings, and will hold about 3,000,000 gallons of water. The excavation and cutting down of the hill required the removal of about 1,700,000 cubic yards of earth and rock—mostly soft rock. Table Four, of Clerk's report, will show the amount expended on this important work up to the 1st of July, 1879, to be but \$130. The expenditures since that date will properly go into the report of my successor. But I may state that up to the 1st of October, 1879, the whole sum paid out amounted to \$5,075 05. The whole cost of the work (it is now completed, but all the bills are not in), will be about \$9,000, besides the brick used. The number of bricks used in its construction was about 1,100,000; the quantity of cement, 1,800 barrels, and over all a heavy coating of asphaltum, so that it is as well and strongly lined as possible. I estimate the number of bricks used in all these improvements at about 4,000,000. We have been engaged for the last seven months in sinking an artesian well, and have it down now, at this writing (October 31st), to a depth of 755 feet. Our contract with the well-borers was to pay them \$6 per foot. We can only express a hope that we may strike water; if so, it would almost repay any outlay. Up to July 1st, 1879, this work had cost \$2,037 01. With our present storage capacity for water, and with the piping and other appliances we have for fighting fire, we may feel perfectly safe from that destroying element in the future. That is, we may if we keep a full supply of water on hand. The Marin County Water Company have furnished us, as indicated by their meter, something over 80,000 gallons per day. For the excess over 80,000 gallons per day they claim compensation, their bill amounting to nearly \$2,000 for the two years ending July 1st, 1879. A majority of the Board of Directors, they alone having authority to audit bills, have felt disinclined to allow anything for the excess, so the matter still remains unsettled. The company measure all the water sent here into our reservoir, through their meter, and charge it to us. They, however, have very many small customers

for water, to whom they sell, fixing their own price and collecting as they please. These customers take the water from our reservoir, through our pipes, and in quantities to suit themselves.

I have been at all times willing to pay the excess whenever I could know its quantity after deducting the amount drawn off by the company's customers. As this is an impossibility, or nearly so, I would suggest some other arrangement be made, satisfactory to both parties if possible. Whilst I have been willing at all times to make an effort to come to some understanding upon the question, my associates on the Board have been unwilling to do anything more for the Water Company than we are now doing. I would advise that the Water Company be required to use the small reservoir on the hill for their other customers, and that in the future they be not allowed to take water from ours, as we will henceforth draw from the new reservoir alone. It was gross official neglect, and a great misfortune, that made it necessary for the State to pay \$1,000 per month for water for use at a public institution located in the country. The Prison should not be at the mercy of any company; should not be in a position to suffer from the caprice or avarice of anybody, but should have water attached to the place as a part of the State's property.

FINANCIAL STATEMENT.

For a complete financial statement I refer to the report of the Clerk:

Table One—Monthly cash receipts. Total, \$940,789 30.

Table Two—Monthly disbursements. Total, \$940,186 29.

These sums are doubled in this way, as will hereafter appear: Money or warrants received are charged as receipts; when deposited in bank it is credited as disbursements; when drawn out it is again charged as "cash received," and when paid out is again credited as disbursements; so that the sum appears twice as great as it actually is.

Table Three—Shows the sources of all receipts, and the amount.

Table Four—Shows for what purpose money was disbursed, and the sum to each item in the list of expenditures. Reference is respectfully made to the note at the foot of this table. It has been a custom to allow the officers \$5 per week in lieu of their board. Many who have families avail themselves of this privilege. Many guards and employes fail to draw their pay regularly from the pay-roll; in such cases the sums are carried to a separate ledger account.

Table Five—Is a recapitulation of cash transactions from July 1st, 1877, to June 30th, 1879, inclusive.

On hand at the date first above given.....	\$1,068 37
Received from all sources.....	940,789 30
Total	\$941,857 67
Disbursed	940,186 29
Amount on hand on the 1st July, 1879.....	\$1,671 38

Table Six—Gives monthly the sums received for merchandise sold, with the aggregate, \$44,252 34.

Table Seven—Gives the assets and liabilities at the end of each month.

Table Eight—This table makes as complete an exhibit of the matters therein specified as it would be possible to make by a tabular arrangement. On the 1st July, 1877, we had 1,318 convicts in the

Prison. We now have 1,564, an increase of 246. The average for the two years is 1,475. The increase for the last two years, it will be seen, is in excess of that of the two years preceding by 13. The total maintaining cost of the Prison for two years has been \$391,980 94. The average number of prisoners being 1,475, it will be seen that the cost of each convict per day is 36 cents and 4 mills. I add here the maintaining cost of the institution for the quarter ending September 30th, 1879. This, of course, will again have to be gone over by my successor, as it will belong to a fiscal period which he will have to cover by his report. But I will doubtless be pardoned for embracing the opportunity to show, as fully as possible, the transactions here under my management:

MAINTAINING COST AT THE CALIFORNIA STATE PRISON, JULY, 1879.

ITEMS.	Amount.	ITEMS.	Amount.
Subsistence -----	\$6,161 92	Water -----	\$1,000 00
Forage -----	399 69	Freight and telegrams -----	14 41
Clothing -----	736 08	Salary -----	5,130 65
Shoes -----	405 87	Wash-house -----	65 29
Beds and bedding -----	208 37	Fuel -----	839 28
Medicines -----	256 72	Postage -----	15 20
Stationery -----	35 94		
General use -----	761 68	Total -----	\$16,058 65
Expense account -----	27 55		

Number of prisoners, July 31st, 1879, 1,553; average cost per day per capita in July, 33.3 cents.

MAINTAINING COST AT THE CALIFORNIA STATE PRISON, AUGUST, 1879.

ITEMS.	Amount.	ITEMS.	Amount.
Subsistence -----	\$5,962 48	Water -----	\$1,000 00
Forage -----	367 61	Salary -----	5,147 95
Clothing -----	1,007 30	Wash-house -----	55 62
Shoes -----	474 39	Fuel -----	340 05
Bed and bedding -----	209 60	Postage -----	12 25
Medicines -----	241 57	Freight and telegrams -----	18 94
Stationery -----	32 55		
General use -----	799 19	Total -----	\$15,695 30
Expense account -----	25 80		

Number of prisoners, August 31st, 1879, 1,558; average cost per day per capita, in August, 32½ cents.

MAINTAINING COST AT THE CALIFORNIA STATE PRISON, SEPTEMBER, 1879.

ITEMS.	Amount.	ITEMS.	Amount.
Subsistence -----	\$5,790 75	Water -----	\$1,000 00
Forage -----	355 82	Salary -----	5,101 90
Clothing -----	829 36	Wash-house -----	58 53
Shoes -----	426 59	Fuel -----	191 38
Beds and bedding -----	252 98	Postage -----	15 55
Medicines -----	260 12	Freight and telegrams -----	31 67
Stationery -----	54 04		
General use -----	683 67	Total -----	\$15,067 16
Expense account -----	14 80		

Number of prisoners, September 30th, 1879, 1,531; average cost per day per capita, in September, 32.7½ cents.

Recapitulation of maintaining cost for quarter ending September 30th, 1879.

July	\$16,058 65
August	15,695 30
September	15,067 16
Total	\$46,821 11

Average number of prisoners during the same period, 1,547; average cost per day per capita, during the same period, 32.8 cents.

Total for subsistence, \$159,834 15, divided as follows:

Guards' mess, officers' mess, and Warden's house	2.783
Brick-yard mess, hospital mess, female mess, wash-house mess, Sundry No. 8 mess, and Masons' mess	2.217
Prisoners in general	9.845

ITEMS.	Total Cost.	Cost in Cents.
Food -----	\$159,834 15	14.845
Water -----	24,000 00	2.228
Salary -----	118,745 49	11.028
Clothing -----	19,772 70	1.836
General use -----	19,568 85	1.817
Forage -----	12,920 04	1.199
Shoes -----	10,277 09	.954
Bedding -----	8,031 35	.745
Medicines -----	4,919 12	.456
Stationery -----	1,170 43	.108
Expense -----	1,479 67	.137
Freight and telegrams -----	736 50	.068
Washing -----	1,499 76	.139
Fuel -----	9,020 59	} .839
Profit and loss -----	5 20	
Totals -----	\$391,980 94	36.399

So far as mere economy is concerned, this is a very marked improvement, one upon which I congratulate the State, and also my associates, who, by their close attention to business, have enabled me to make this flattering exhibit:

The maintaining cost, daily, for each prisoner for the last quarter has been	32.8
For two years ending June 30th, 1879	36.4
For two years ending June 30th, 1877	42.7
For two years ending June 30th, 1875	44.0
For two years ending June 30th, 1873	53.4

Without going into details, or making a lengthly comparative statement, showing the maintaining cost in each of the States, I will abridge this report by saying we are much below the average of American prisons in supporting cost. In fact I have found but three penitentiaries, run under our system, which are cheaper than ours, namely:

West Virginia	31 $\frac{5}{8}$
Sing Sing	28 $\frac{1}{2}$
Auburn	31.0

The three New York penitentiaries, Auburn, Sing Sing, and Clinton average 34 cents 9 mills; the Clinton being at a cost of 45 cents 5 mills. I divide the daily average cost per convict as follows, which I believe to be a correct analysis of Table Eight, of the Clerk's report.

Table Nine—Gives the maintaining cost per capita per month of the different items, fractions of mills left out, except in profit and loss.

Table Ten—Gives the monthly earnings, from which it will be seen that the total is but \$100,269 56.

Table Eleven—Specifies the earnings from which it will be seen that but \$93,713 70 were earned by labor. This miserable showing is not to be attributed in any way to want of zeal and proper exertions on the part of the Directors and officers of the Prison, but to the bad laws governing us in the letting of labor. For six years past the law has prohibited the letting of the labor for less than fifty cents per day. This has prevented us from hiring the men except in limited numbers. I believe we would have been able to make this a self-supporting institution but for this unwise limitation. With this restriction, and no appropriation, or law authorizing us to work the prisoners on State account, we have been compelled to let four-fifths of them remain idle, or employ them in unproductive labor. I recommend that even now, at this late day, the whole matter of letting prisoners for the next two years, be left to the Directors and Warden to do the best they can. I say for the next two years, for after that time, under the provisions of the new Constitution, no labor can be let out by contract, but all convicts must be worked on State account.

In view of this constitutional restriction, I would recommend that the Legislature make provisions by appropriations, for the working of the prisoners in the discretion of the Directors and Warden. I would do this for the reason that it may be difficult to find contractors, even if the fifty cents restriction should be removed, who would be willing to take the hazard in any mechanical enterprise with a full knowledge that they must break up their business at the end of two years.

The present contractors are the California Furniture Manufacturing Company, working from 100 to 125 men—Stone & Hayden, J. C. Johnson & Company, Armes & Dallam, and the door and sash company, are each working a number of men, but none of them have taken contracts. I suppose they will all continue to employ a limited number of prisoners until the new Constitution turns them out. They all together work about 300 men, the number varying according to the pleasure of the employers.

Table Twelve—Gives the income per month.

Table Thirteen—Specifies the income.

Here it will be seen that the total sum received from the State treasury is \$374,000. This shows an actual cost to the State of \$187,000 per year, all of which might have been saved to the people but for the reckless reform legislation which has prevented the hiring of prison labor. The sale of manufactured articles on this coast, other than cloth, will amount to over \$20,000,000 yearly, yet this miserable policy has been adopted for fear that \$180,000 worth of such articles, manufactured by convicts for their own support, would produce injurious competition with the honest mechanic. If the labor could be generally distributed, or even distributed among eight or ten different kinds of manufactures, no one could possibly feel the result except the taxpayers, particularly, as we are buying and selling convict-manufactured articles from several other States. Reference is here made to the explanatory note at the foot of this table.

It will be seen that we have sold \$18,101 16 worth of brick; and, also, \$7,793 52 worth of live stock. This is for the sale of hogs mostly. But for the very bad luck we have had in fattening hogs we might have sold twice or three times the number. We have tried by purchase to keep a sufficient number on hand to consume the waste material from the kitchens and dining-rooms, but by reason of the prevalence of an epidemic we have lost many hundred; so that for several months past we have kept on hand a very few, hoping the disease would eventually expend its force and die out.

Table Fourteen—Gives the expenditures per month, other than for maintaining cost, aggregating \$56,699 78.

Table Fifteen—Specifies the items making up the sum total as shown in Table Fourteen.

At the conclusion will be found a statement of assets and liabilities. This is the general balance sheet, showing assets and liabilities. The liabilities are, of course, set down correctly, but the assets are in no case supposed to represent the true value of the property on hand, except in the case of goods in store. To illustrate: in the case of live stock the real value is, I suppose, about \$3,500, while it is set down at \$175. This comes from the complete system of book-keeping by which purchases and sales are recorded, showing finally that the original cost has been as represented in the schedule. This result has been reached mainly by the purchase of hogs at a less price than sold for, they being bought light and increased in weight by fattening.

LABOR OF CONVICTS, OTHER THAN THOSE EMPLOYED BY CONTRACTORS,
OUTSIDE THE WALLS.

IN WHAT CAPACITY EMPLOYED.	Number of Men.	IN WHAT CAPACITY EMPLOYED.	Number of Men.
Brick-yard and excavations	180	Stable	7
Blacksmiths	6	Sweepers	4
Butchers	2	Servants	16
Carpenters	4	Waiters, officers' dining-room	4
Cart drivers	16	Wood-yard	4
Cooks for officers	3	Wash-house	5
Commissary department	8	Warden's office	4
Clerk's office	2	Warden's residence and gardeners	10
Gardeners	10		
Kitchen help	7	Total	292

LABOR INSIDE THE WALLS—OTHER THAN CONTRACT LABOR.

IN WHAT CAPACITY EMPLOYED.	Number of Men.	IN WHAT CAPACITY EMPLOYED.	Number of Men.
Bath tenders.....	2	Lamp-room.....	3
Brick-layers' gang.....	10	Library and school-room.....	95
Barber shops.....	12	Mortar mixers and carriers.....	6
Boiler-houses (2).....	10	Mattress makers.....	3
Coopers.....	2	Painters.....	5
Cooks.....	18	Plumbers.....	4
Closet cleaners.....	12	Room tenders.....	12
Captain of the Yard's office.....	5	Shoe shop.....	20
Dining-room.....	38	Tailor shop.....	10
Door tenders.....	14	Tin shop.....	5
Donkey engine.....	3	Turnkey's office.....	4
Engine-room.....	3	Wood-yard.....	4
Gate-keepers.....	8	Whitewashers.....	5
Gate, upper.....	3	Wash-house.....	45
Gate, lower.....	3	Yard sweepers.....	14
Hospital cooks.....	5		
Hood's gang.....	7	Total inside.....	394
Hospital help.....	8	Total outside.....	292
<hr/>			
Total employed for State and at school.....			686
Of this number about eighty-five are kept at school, the whole of them being boys.....			85
<hr/>			
Leaving the number who labor other than for contractors.....			601
<hr/>			
Whole number employed inside in the shops, on an average.....			300
Inside in other capacities.....			394
Outside in various capacities.....			292
<hr/>			
Total employed.....			986

This leaves a surplus of over 500 that must be kept in close confinement. We recognize the great wrong thus done these prisoners, but we are powerless to remedy the evil. It will be understood that all attempts at order and discipline with 500 convicts at large in the Prison-yard would be absolutely futile. We do the best we can for these convicts by letting out a limited number at a time for exercise by walking between the cells and in the rear yard of the Prison. It will also be seen that in every case, except in the shop labor, we put on all the force possible to crowd in. This is not done because the work is done better or even so well with large gangs, but to give the prisoners exercise and air. In many cases one quarter of the force employed would do the work better. Much of the labor done by these men is of a purely penal nature, and for exercise and air, being of but little utility and bringing no return.

TURNKEY'S REPORT.

From the Turnkey's report, Table I, it will be seen that the total number of prisoners received at this institution since its found-

ation, in 1851, has been 9,320, and that the total discharges have been 7,756, leaving now in prison 1,564 :

There remained in prison on the 1st of July, 1877	1,318
Received to July 1st, 1878	715
Received to July 1st, 1879	604
<hr/> Total	<hr/> 2,637
Discharged to July 1st, 1878	546
Discharged to July 1st, 1879	527
<hr/> Total	<hr/> 1,073
<hr/> Total remaining in prison July 1st, 1879	<hr/> 1,564

It will be seen that the increase for two years has been 246.

Table II—Shows the receipts and discharges for each month, and the number on hand.

Table III—Gives the nativity of prisoners. To this table I call especial attention, particularly to the nativity of the foreign criminals, and the percentage from each country. This table, just as here presented, would be a powerful argument with which to meet our eastern friends, who think Chinese immigration a blessing. It will be seen that our population is :

Foreign	731
American—United States	833
<hr/> Total	<hr/> 1,564

Of which 267 are Chinese.

Percentage of American—United States	53.20
Percentage of foreign	46.80
<hr/> Total	<hr/> 100.00

Table IV—Makes a classification of crimes, for which prisoners have been convicted, and the number to each. From this table it will be seen that over 500 prisoners, one-third, nearly, of all, come here for burglary and other crimes connected with burglary and attempts at burglary. It will also be seen that 219 are here for highway robbery and attempts at robbery. I call especial attention to these two classes, and beg to suggest that their punishment is not sufficiently severe to deter the regular professional from engaging in his calling. There are large numbers of burglars here serving out sentences, ranging in duration from one to two years; and there are large numbers of highwaymen here who stopped stages and travelers, intending to take life if they encountered resistance, serving sentences of from three years up. This appears wrong, and is wrong, but it may be partially remedied by proper legislation, and prison life made laborious.

Table V—Gives the terms of imprisonment and number to each term.

Under this table, the fact will be noticed that 97 prisoners are held for life. This, I believe to be wrong, for to every one should be left grounds for hope that they may some day be free. This applies to those who are in for 30 and 40 years, and who in the regular course of nature can only be set free by death. A little conditional clemency by the Executive would light up the gloomy hearts of these wretched men with a hope that would at least drive out despair. This must

be done to make anything of them other than brooding, plotting, unreliable, unsafe, treacherous, and unhappy criminals. This is natural, for the prisoner who despairs of ever earning his freedom, only awaits his opportunity for murder, if thereby he has the least chance of escape.

Table VI—Gives the ages of the prisoners.

From this table it will be seen that there are 470 prisoners 25 years old and under; 273, 22 years old and under; 202, 21 years and under; 144, 20 years and under; 101, 19 years old and under; 69, 18 years and under; 36, 17 years and under; 18, 16 years and under; 7, 15 years and under, and two children of fourteen.

It is safe to estimate that seventy-five per cent. of these unfortunate boys have been exiled from home, to adopt a course of crime, by the drunkenness and cruelty of parents.

They nearly all tell the same tale of misery, want, intemperance, parental neglect, and cruelty. If it is the fault of the laws and of society that these boys have become criminals, then they should be peculiarly the care of the public whose fault is their ruin. Idleness in almost every case has proved the downfall of these boys, nor has this resulted from their own choice, but because employment could not be obtained. The work they would gladly have done has been performed by the Chinaman, and they have been turned from door to door until despair and absolute want have driven them to the commission of crime. In nearly all cases theirs were crimes against property, such as are only committed by the suffering—those in want of shelter, clothing, and food. Less whisky and more work would have saved nearly all of these boys to society, many of them to become its best ornaments and most useful men.

Table VII—Gives the educational condition of the prisoners.

Table VIII—Gives the number of prisoners from each county in the State.

It will here be seen that San Francisco sends to the State Prison 525; Alameda sends 63; Los Angeles sends 64; Sacramento sends 86; San Joaquin sends 84. Sacramento and San Joaquin have the largest per centage of criminals; Los Angeles and Alameda next; Del Norte, Alpine, and Trinity being the lowest, and Sutter next.

Table IX—Gives the former occupation of the prisoners.

It appears from this table that an exceedingly undue proportion of cooks have been so unfortunate as to commit crimes, the number being set down at 104. It also appears that 648 give their calling as that of laborer. It would be safe to estimate that not ten per cent. of the number ever earned a living by labor, hence they are convicts.

Table X—Gives the number of returns, and how often.

From this table it appears that 2 prisoners are serving out their seventh term; 4, their sixth; 15, their fifth; 24, their fourth; 82, their third, and 250, their second. From this it will be seen that of 1,554 prisoners, 377 have been returned and are serving beyond their first terms. It appears from this that not quite one-fourth are now serving other than their first sentences.

At the Auburn Penitentiary, New York, there are 1,193, of whom 218 are serving beyond their first sentence. This is nearly the same percentage as ours, but not quite so large. At the Clinton (New York) Penitentiary there are 365 convicts, 118 serving beyond their first sentence. This shows a very much larger percentage of returns than is found in our Prison, being a fraction less than one-third of

the whole. I am unable to find any record of the returns to the Sing Sing Prison, although I have the latest annual report of the Warden and Superintendent.

Table XI—Is an exhibit of the workings of the "Goodwin Credit Bill," passed by the last Legislature. The change from the law of 1864 is not great, chiefly benefiting three, four, and five-year convicts. The law as it now stands is an exact copy, so far as the credits are concerned, of the law governing the same subject in New York. I believe it to be a good law, and that it should be allowed to remain without amendment.

Table XII—Gives the amount of clothing, shoes, hats, and bedding issued to convicts.

Following the Turkey's report will be found that of the Moral Instructor, to which I refer with great pleasure. The report is so complete within itself I need do no more than refer to it, and to express my entire satisfaction with the good results obtained by the unremitting care and attention of that faithful officer.

Lastly, I refer to the very able report of Dr. Pelham, the Prison Physician. Like that of the Moral Instructor, it is so full and complete within itself that it needs no explanatory remarks.

Before closing this report, I respectfully call attention to the law passed four years ago, and known as the "Giffen Bill." This Act is, in many of its provisions, in direct conflict with the new Constitution, and, to prevent complication, ought to be repealed at the earliest time possible. Even had the new Constitution never been adopted this law, in my judgment, would have resulted in nothing good, but would have been productive of much evil. Two years ago I recommended its repeal, believing then, as I do now, that if allowed to remain on the statute book until the 1st of January, 1880, the time fixed for it to take effect, that evil would result from it.

In closing this report I congratulate the faithful officers here upon the provisions of the new Constitution, setting the Prison management beyond the uncertainties of political strife, and making it a non-partisan institution. The people's decision, that a man's qualifications for prison management shall not be determined by his politics, will, doubtless, abate the severity of the *machine* and cause the selection of the fittest. I hope for good results under the new system about to be inaugurated.

I have the honor to be, very respectfully,

JAMES A. JOHNSON,
Warden and Resident Director.

CLERK'S REPORT OF THE CALIFORNIA STATE PRISON.

Commencing July 1st, 1877, and ending June 30th, 1879.

L. BARTLETT, CLERK BOARD OF DIRECTORS CALIFORNIA STATE PRISON.

SAN QUENTIN, CALIFORNIA, JULY 1, 1879.

CLERK'S REPORT.

TABLE ONE OF BUILDINGS.

Recapitulation of building expenditures.

ITEMS.	Cost.
Work-shop	\$129,995 00
Two hundred and four single cells	41,219 93
Forty-eight double cells	23,968 66
Library, kitchen, and dining-room	10,412 92
Clerks' offices and store-room	4,582 74
Forage for horses, while building	2,000 00
Elevator improvements	330 00
Total	\$212,509 25
Received from the State treasury as per building appropriation	\$200,003 00
Expended from the General Fund	12,506 25
Total	\$212,509 25

TABLE TWO OF BUILDINGS.

Building Fund Expenditures, commencing May 1st, 1876, and ending October 31st, 1878.

ITEMS.	Cost.
<i>Work-shops.</i>	
Lumber	\$18,790 43
Iron	530 71
Lime	5,455 10
Cement	2,315 50
Sand	1,885 78
Water-pipe and fittings	4,831 58
Wood for burning brick	9,598 98
Axle pulleys	63 80
Fire-brick	31 50
Engine	19,225 00
Boilers	9,700 00
Steam-boiler and heater	400 00
Fixtures for engine and boiler	2,245 50
Tin roofing	2,352 40
Asphaltum and tar	272 85
Granite blocks and sill	1,306 66
Nails	442 50
Screws, bolts, nuts, and rivets	631 73
Tools	589 80
Paints, oils, and lead	475 28
Powder and fuse	32 45
Glass	647 35
Tobacco issued to prisoners	847 33
Sashes	424 00
Stair-railings	239 12
Coal and coke	156 29
Iron castings	627 90
Hose and couplings	965 81
Water-gates	216 75
Ropes and blocks	110 35
Carried forward	\$84,386 33

TABLE TWO OF BUILDINGS—Continued.

ITEMS.	Cost.
Brought forward	\$84,386 33
Derrick	45 00
Truck and barrow wheels	71 00
Elevator	2,747 00
Water-closets	242 75
Smoke-pipe	95 00
Plumbing	1,450 00
Leather belting	694 00
Iron doors	2,750 00
Hire of donkey engine	240 50
Wages to carpenters and masons	28,460 63
Salary to architect	4,000 00
Sawing lumber, etc.	481 28
Freight and drayage on merchandise	367 04
Interest	2,253 44
Discount on Controller's warrants	1,136 47
Advertising	39 00
Postage, expressage, and telegrams	22 50
Less credit for empty barrels sold	\$489 41
Merchandise returned	23 65
	<u>513 06</u>
Cost of work-shop:	<u>\$129,995 00</u>
<i>Two hundred and four single cells.</i>	
Iron	\$28,515 43
Lime	1,275 00
Tools	102 63
Charcoal	13 67
Repairing surveying instrument	10 00
Tobacco issued to prisoners	344 09
Cement	1,202 50
Wages	1,104 00
Freight	50 40
Paints, oils, etc.	329 45
Hose	80 00
Sand	295 55
Asbestos roofing	330 67
Pipes and fixings	32 20
Nails	31 26
Iron balcony railings	1,050 00
Lumber	808 57
Postage, etc.	6 50
Asphaltum and tar	237 25
Bolts, rivets, and nuts	22 78
Interest	254 64
Locks for cell doors	1,227 00
Iron beams	752 76
Discount on warrants	221 50
Moulding	32 58
Salary to architect	3,000 00
Total	<u>\$41,330 43</u>
Less credit for empty barrels sold	110 50
Cost of two hundred and four single cells	<u>\$41,219 93</u>

TABLE TWO OF BUILDINGS—Continued.

ITEMS.	Cost.
<i>Forty-eight double cells.</i>	
Iron	\$10,250 00
Lumber	1,000 00
Building iron cells, per contract	4,547 00
Wages	3,350 00
Lime	350 00
Cement	350 00
Sand	300 00
Iron beams	695 16
Tools	50 00
Paints, oils, etc.	400 00
Coal and coke	80 00
Locks for cell doors	844 00
Sill plates	180 00
Iron railings	584 00
Roofing	502 50
Interest	390 00
Arch plates	48 00
Grates	48 00
Cost	<u>\$23,968 66</u>
<i>Building containing library, two shop-rooms, kitchen, and dining-room.</i>	
Lime	\$1,065 40
Cement	175 30
Freight and drayage	50 00
Pipes and fixings	200 00
Fire-brick and hardware	58 42
Sand	740 00
Salary to architect	750 00
Cord-wood, for burning asphaltum	89 40
Tobacco issued to prisoners	150 00
Paint and whitewash brushes	41 00
Windows and frames	149 25
Rivets, bolts, nuts, etc.	33 27
Wages	645 50
Tin roofing	900 01
Iron	282 74
Tools	75 00
Nails	101 38
Doors	47 38
Paints, oils, etc.,	96 38
Asphaltum	1,168 70
Charcoal	19 75
Tar	201 25
Railings	25 62
Boiler and fixings	482 82
Lumber	2,940 00
Total	<u>\$10,488 57</u>
Less credit for empty barrels sold	75 65
Cost	<u>\$10,412 92</u>

TABLE TWO OF BUILDINGS—Continued.

ITEMS.	Cost.
<i>Building containing Clerk's office and store-room.</i>	
Wash-basin and fixtures	\$26 50
Lime	400 00
Cement	50 00
Granite sills	50 00
Iron vault	650 00
Interest	17 65
Freight	14 97
Pipes and fixings	78 57
Sand	213 00
Salary to architect	150 00
Brushes, brooms, and painting tools	62 80
Window frames	19 49
Rivets, bolts, etc.	33 00
Wages	250 00
Roofing	400 27
Sash and blinds	300 00
Tools—carpenters and masons	119 77
Sewer pipe	55 38
Plaster Paris	99 70
Nails	37 20
Doors	175 38
Mantel	50 00
Center-piece	11 75
Locks	20 24
Paints, oils, etc.	250 00
Lumber	1,087 07
Total	\$4,622 74
Less credit for empty barrels and plaster Paris sold	40 00
Cost	\$4,582 74

TABLE OF OFFICERS.

Salaries paid to officers, guards, and employes of the California State Prison.

RANK.	Per Month.
Warden, per diem	\$10 00
Captain of the Guard	\$150 00
Captain of the Yard	150 00
Surgeon	150 00
Commissary	150 00
Clerk	125 00
Turnkey	125 00
First Gate-keeper	125 00
Assistant Commissary	100 00
Second Gate-keeper	100 00
Engineer	100 00
Moral Instructor	80 00
Captain of the First Watch	80 00
Captain of the Second Watch	80 00
Prisoners' Steward	75 00
Officers' and Guards' Steward	60 00
Hostler	60 00
One guard	75 00
One guard	65 00
Sixty guards, per guard	50 00
Total per month having 30 days	\$5,150 00
Total per month having 31 days	\$5,160 00

TABLE ONE.

Cash receipts per month, from July 1st, 1877, to July 1st, 1879.

MONTHS.	Amount.	MONTHS.	Amount.
1877.		1878.	
July -----	\$116,446 87	August -----	\$55,667 00
August -----	6,149 61	September -----	34,056 51
September -----	67,720 35	October -----	36,079 44
October -----	37,385 83	November -----	34,729 29
November -----	23,048 72	December -----	26,881 44
December -----	11,560 42		
1878.		1879.	
January -----	7,447 87	January -----	35,512 03
February -----	21,764 42	February -----	29,824 78
March -----	103,100 84	March -----	31,556 51
April -----	5,754 84	April -----	38,103 95
May -----	79,480 66	May -----	23,558 22
June -----	7,887 37	June -----	43,701 07
July -----	63,371 26	Total -----	\$940,789 30

TABLE TWO.

Cash disbursements per month, from July 1st, 1877, to July 1st, 1879.

MONTHS.	Amount.	MONTHS.	Amount.
1877.		1878.	
July -----	\$114,830 35	August -----	\$53,907 55
August -----	7,795 61	September -----	33,774 90
September -----	68,675 16	October -----	36,275 26
October -----	36,861 89	November -----	33,717 35
November -----	21,657 24	December -----	27,660 62
December -----	12,714 87		
1878.		1879.	
January -----	6,038 73	January -----	35,233 34
February -----	22,286 42	February -----	30,601 97
March -----	102,630 47	March -----	30,564 81
April -----	6,989 37	April -----	38,362 72
May -----	79,571 64	May -----	25,427 63
June -----	7,809 51	June -----	42,720 32
July -----	64,078 56	Total -----	\$940,186 29

TABLE THREE.

Cash receipts, showing source from whence derived, from July 1st, 1877, to July 1st, 1879.

SOURCE RECEIVED FROM.	Amount.
State treasury	\$375,250 00
Nevada Bank—gold	364,015 55
Nevada Bank—silver	22,593 31
First National Gold Bank	19,392 61
United States	8,666 20
Contractors and their employes	108,164 16
Prisoners' deposits	10,857 62
Brick account	12,589 44
Building Fund	5,310 77
Sale of live stock	4,500 62
Sale of merchandise	6,889 43
Washing	879 14
Repairing tin-ware	90 55
Sale of medicine	168 45
Repairing shoes	792 30
Labor	164 25
Sale of kindling-wood	234 42
Discount and premium	228 98
Freight	1 50
Total	\$940,789 30

TABLE FOUR.

Cash disbursements, showing on what account paid, from July 1st, 1877, to July 1st, 1879.

ON ACCOUNT OF—	Amount.
Merchandise	\$372,691 36
Nevada Bank—gold	364,697 31
Nevada Bank—silver	22,133 14
First National Gold Bank	18,680 27
Water	24,000 00
Salary	95,050 30
Building account	7,738 24
Live stock	4,207 33
Officers and guards, as per ledger account	7,974 70
Prisoners' deposits	6,105 83
Discharged prisoners	2,772 00
Transportation of prisoners	1,081 90
Transportation of insane prisoners	30 00
Return of escaped prisoners	363 10
Interest	1,755 42
Discount on treasury drafts	445 75
Discount and premium	190 65
Expense, postage and expressage	1,400 97
Freight and telegrams	915 61
Brick account	1,185 25
Subsistence	3,946 50
United States	35 00
Profit and loss	4 00
Real estate	500 00
Prison improvements	114 65
Denner & Company, on account of artesian well	2,037 01
Reservoirs	130 00
Total	\$940,186 29

NOTE—Subsistence consists of money paid to officers as allowance in lieu of board.

Profit and loss consists of bad coin received.

Officers and guards as per ledger account, consists of those that were not carried on the salary pay-book; they not drawing the money regular as it became due to them, and therefore ledgered.

TABLE FIVE.

Cash recapitulation, from July 1st, 1877, to July 1st, 1879.

ITEMS.	Amount.
On hand July 1st, 1877 -----	\$1,068 37
Received from July 1st, 1877, to July 1st, 1879 -----	940,789 30
Total -----	\$941,857 67
Disbursed from July 1st, 1877, to July 1st, 1879 -----	940,186 29
Remaining on hand July 1st, 1879 -----	\$1,671 38

TABLE SIX.

Sales of merchandise per month to officers, guards, contractors, and their employés, from July 1st, 1877, to July 1st, 1879.

MONTHS.	Amount.	MONTHS.	Amount.
1877.		1878.	
July -----	\$1,330 46	August -----	\$1,732 78
August -----	1,436 50	September -----	1,743 09
September -----	1,497 21	October -----	1,794 16
October -----	1,490 28	November -----	2,012 10
November -----	1,808 49	December -----	2,127 52
December -----	2,040 89		
1878.		1879.	
January -----	1,897 08	January -----	2,131 86
February -----	1,675 38	February -----	2,052 71
March -----	1,918 38	March -----	2,128 13
April -----	1,833 48	April -----	1,914 37
May -----	1,825 62	May -----	1,955 08
June -----	1,990 36	June -----	2,160 93
July -----	1,755 48	Total -----	\$44,252 34

TABLE SEVEN.

Assets and liabilities on the last day of each month, commencing July, 1877, and ending June, 1879.

MONTHS.	Assets.	Liabilities.
1877.		
July	\$409,992 83	\$33,987 95
August	410,905 75	47,297 97
September	414,639 62	28,403 66
October	416,262 47	30,338 88
November	413,168 20	38,896 14
December	411,981 19	50,656 58
1878.		
January	412,529 67	63,436 50
February	453,698 74	58,040 52
March	456,186 36	26,521 47
April	456,788 97	36,861 24
May	458,757 05	14,400 71
June	461,467 28	28,574 64
July	465,435 53	19,284 75
August	465,233 37	15,955 28
September	459,425 43	16,286 27
October	458,389 03	15,951 03
November	469,627 83	14,491 57
December	474,072 95	19,678 87
1879.		
January	469,421 00	15,691 85
February	466,862 73	15,359 73
March	468,598 21	17,221 17
April	473,944 75	17,480 06
May	487,548 59	28,469 65
June	474,517 49	17,269 34

TABLE NINE.

Maintaining cost per capita per month of the different items—fractions of mills left out, except in profit and loss.

Month.	Subsistence.	Water.	Salary.	Clothing.	General use.	Forage.	Shoes.	Bedding.	Medicines.	Stationery.	Expense account.	Freight and telegrams.	Washing.	Fuel.	Profit and loss.
1877.															
July	4 89.9	75.8	3 66.7	42.9	52.5	44.1	26.9	7.5	12.3	3.8	3.5	1.2	6.6	31.9	---
August	5 30.5	75.4	3 64.2	51.1	52.1	61.6	29.5	19.0	13.5	7.9	2.2	1.9	4.8	24.2	---
September	4 87.4	74.5	3 56.2	53.0	45.1	49.9	27.3	20.3	14.9	2.5	2.3	2.2	5.3	28.0	---
October	5 14.7	70.7	3 47.3	74.4	45.8	59.6	31.9	54.9	18.2	7.6	2.8	2.4	6.3	18.4	17
November	4 79.6	70.6	3 45.9	59.9	54.9	47.7	24.8	20.2	10.9	6.0	3.2	3.9	6.2	28.5	---
December	5 11.8	68.9	3 24.9	45.0	63.0	55.4	23.2	41.3	10.7	4.7	1.6	2.7	6.3	28.7	---
1878.															
January	4 65.6	68.8	3 21.3	55.3	52.2	37.9	29.9	26.3	10.9	8.4	2.2	1.9	3.9	34.9	---
February	4 98.3	68.2	3 19.0	63.4	49.6	43.0	29.2	34.8	12.3	3.0	3.6	2.6	3.7	45.9	---
March	4 51.7	67.8	3 15.8	57.8	58.3	39.7	26.3	27.3	13.0	4.3	3.0	0.9	3.2	28.0	500
April	4 45.9	67.1	3 33.5	58.5	74.3	30.6	31.5	15.0	11.7	4.5	3.0	1.3	3.7	35.0	1473
May	4 69.8	66.8	3 34.9	61.9	76.4	53.2	26.8	18.6	12.8	1.2	2.2	5.0	3.8	29.6	---
June	4 51.8	67.2	3 34.2	69.4	50.5	36.0	43.6	16.1	13.4	1.7	36.1	1.6	3.8	20.8	1299
July	4 78.7	68.3	3 42.2	38.0	52.0	33.0	33.4	7.2	18.8	2.3	2.8	2.4	3.8	21.5	1489
August	4 49.6	68.4	3 41.5	60.4	51.0	29.0	35.2	13.9	16.0	2.9	2.4	3.1	3.1	17.1	---
September	4 29.2	66.8	3 32.4	50.3	49.6	33.2	24.7	27.7	4.8	1.1	2.3	1.5	4.2	14.8	---
October	4 99.5	66.4	3 29.3	50.9	48.9	22.1	32.6	27.6	16.4	1.5	4.1	2.7	3.2	20.2	500
November	4 16.5	66.2	3 33.8	59.9	55.5	24.2	36.4	26.8	14.8	0.7	2.0	2.8	3.3	19.5	1506
December	4 23.5	63.5	3 27.8	44.4	52.7	20.7	24.2	24.1	16.0	2.1	2.2	2.3	3.7	25.4	---
1879.															
January	4 64.7	65.6	3 43.4	47.9	47.8	28.2	23.0	25.5	12.9	3.7	3.3	1.4	3.2	30.3	125
February	3 83.1	65.2	3 28.3	59.5	51.4	19.6	23.5	23.6	13.6	1.9	2.3	2.9	4.3	23.3	331
March	4 21.6	64.0	3 29.5	64.0	61.6	29.3	28.3	18.5	17.6	2.1	3.2	0.3	4.3	18.8	---
April	4 19.6	63.5	3 27.4	46.9	54.0	26.7	31.2	13.9	13.7	1.7	2.5	---	3.4	19.7	---
May	4 37.0	63.6	3 28.0	58.0	55.6	33.5	28.9	24.2	14.5	2.8	2.5	1.1	3.5	10.9	---
June	4 24.1	63.9	3 29.7	52.5	66.2	26.0	26.4	16.2	17.4	1.4	2.8	1.5	3.9	36.8	---

TABLE TEN.

Earnings per month, from July 1st, 1877, to July 1st, 1879.

MONTHS.	Amount.	MONTHS.	Amount.
1877.		1878.	
July -----	\$2,855 95	August -----	\$4,359 46
August -----	3,221 42	September -----	4,198 17
September -----	3,184 50	October -----	4,359 37
October -----	4,137 09	November -----	4,527 25
November -----	4,612 73	December -----	4,727 36
December -----	3,855 92		
1878.		1879.	
January -----	3,860 22	January -----	5,348 04
February -----	3,277 72	February -----	5,236 98
March -----	3,480 49	March -----	6,080 95
April -----	3,391 71	April -----	5,788 00
May -----	4,254 05	May -----	4,041 30
June -----	4,370 53	June -----	2,653 30
July -----	4,447 05	Total -----	\$100,269 56

TABLE ELEVEN.

Specified earnings from July 1st, 1877, to July 1st, 1879.

ITEMS.	Amount.
Labor -----	\$93,713 70
Drayage -----	3,671 00
Wash-house -----	1,421 56
Shoe shop -----	1,072 92
Tin shop -----	390 38
Total -----	\$100,269 56

TABLE TWELVE.

Income per month, from July 1st, 1877, to July 1st, 1879.

MONTHS.	Amount.	MONTHS.	Amount.
1877.		1878.	
July -----	\$57,195 75	August -----	\$23,112 73
August -----	3,244 75	September -----	13,392 90
September -----	36,056 30	October -----	14,907 77
October -----	17,112 91	November -----	13,376 10
November -----	2,344 45	December -----	9,959 13
December -----	394 15		
1878.		1879.	
January -----	1,296 43	January -----	10,789 24
February -----	17,136 17	February -----	9,953 78
March -----	50,961 80	March -----	12,610 57
April -----	1,638 80	April -----	13,631 57
May -----	38,268 72	May -----	16,494 00
June -----	2,455 80	June -----	12,579 00
July -----	30,268 64	Total -----	\$410,931 46

TABLE THIRTEEN.

Specified income from July 1st, 1877, to July 1st, 1879.

ITEMS.	Amount.
Forage "from Building Fund" -----	\$2,000 00
State treasury -----	374,000 00
Support of United States prisoners -----	8,754 65
Sale of brick -----	18,101 16
Sale of live stock -----	7,793 52
Discount and premium -----	233 53
Profit and loss -----	48 60
Total -----	\$410,931 46

NOTE.—Table Three, receipts from State treasury give \$375,250. Table Thirteen gives the income at \$374,000. The difference, \$1,250, was received for transportation of discharged prisoners, and not considered an income.

TABLE FOURTEEN.

Expenditures per month, other than maintaining cost, from July 1st, 1877, to July 1st, 1879.

MONTHS.	Amount.	MONTHS.	Amount.
1877.		1878.	
July -----	\$1,983 03	August -----	\$1,455 24
August -----	1,723 61	September -----	1,011 06
September -----	960 12	October -----	8,047 00
October -----	15,724 55	November -----	1,162 99
November -----	735 43	December -----	3,072 77
December -----	1,202 10		
1878.		1879.	
January -----	1,053 89	January -----	880 80
February -----	745 12	February -----	2,136 62
March -----	1,169 91	March -----	2,212 36
April -----	1,295 60	April -----	2,635 57
May -----	2,146 57	May -----	1,903 24
June -----	1,444 06	June -----	1,092 92
July -----	905 24	Total -----	\$56,699 78

TABLE FIFTEEN.

Specified expenditures from July 1st, 1877, to July 1st, 1879.

ITEMS.	Amount.
Real estate.....	\$500 00
Reservoirs and artesian well.....	2,319 26
Discharged prisoners.....	2,772 00
Interest.....	2,047 60
Discount on Controller's warrants.....	445 75
Discount and premium.....	190 65
Prison improvements.....	11,010 68
Wagons and harness.....	1,183 73
Brick yard.....	24,401 25
Ordnance.....	476 80
Furniture and crockery.....	2,799 55
Engines and machinery.....	894 95
Pipes and fittings.....	30 50
Live stock.....	5,477 24
Transportation of prisoners.....	1,081 90
Transportation of insane prisoners.....	30 00
Return of escaped prisoners.....	363 10
Hardware and tools.....	674 82
Total.....	\$56,699 78

NOTE.—In the expenditures on account of reservoirs and artesian well is included \$2,037 01 paid to Demner & Company, as per Table Four, on account of artesian well.

Assets, June 30th, 1879.

Buildings.....	\$339,533 77
Engines and machinery.....	35,257 95
Pipes and fittings.....	15,030 50
Beds and bedding.....	9,000 00
Furniture, crockery, and tin-ware.....	10,799 55
Merchandise.....	3,365 47
Reservoirs.....	20,071 60
Real estate.....	7,800 00
Ordnance.....	2,493 65
Hardware and tools.....	5,174 82
Live stock.....	175 39
Wagons and harness.....	3,716 50
Cash.....	1,671 38
Medicines.....	250 00
Due by sundry debtors.....	20,176 91
Total.....	\$474,517 49

Liabilities.

Merchandise.....	\$14,329 16
Prisoners' deposits.....	2,919 30
Governor Johnson.....	20 88
Total.....	\$17,269 34
Excess of assets.....	\$457,248 15

NOTE.—Live stock consists of horses, cows, mules, hogs, chickens, etc.

TURNKEY'S BIENNIAL REPORT.

TABLE I.
Prison account from 1851 to July 1st, 1879.

YEARS.	Prisoners received by order of Court	Pardons revoked	Escapes recaptured	Returned from Insane Asylum	Total receipts	Discharged per Act, and restored	Pardoned by the Governor	Pardoned by the President	Discharged by expiration of sentence	Discharged by commutation of sentence	Discharged by order of Court	Escaped	Discharged by Secretary of War	Discharged by Secretary of Navy	Discharged by General Schofield	Discharged by Prison Directors	Died and killed	Sent to Insane Asylum	Restored to citizenship by the Governor	Discharged per Act	Total discharged
1851	35		3		35				12			1					1				1
1852	105		2		105		2		38			6					3				21
1853	163		16		165		14		87			8					6				58
1854	211		25		227		29		94			28					1		1		194
1855	265		30		291		18		103			25					5		4		157
1856	258		32		287		28		114			72					14				196
1857	245		33		277		27		94			23					5		2		224
1858	226		33		259		38		119			45					17		16		191
1859	220		30		270		35		145			127					8		1		299
1860	235		20		315		34		130			30					15				314
1861	238		9		247		54		153			4					1				212
1862	190		74		264		11		134			24					15		4		286
1863	163		4		167		24		66			3					4				183
1864	232		2		234		43		11			10					17				196
1865	235		7		236		7		11			3					8				177
1866	254	1	2	1	258		25	8	3			4	3				16				126
1867	287				287		41		3			5					10				171
1868	284	1			285		40		3			7					10				289
1869	332		1		333		110		5			1	1				10				363
1870	375			1	376		155	1	3			2					10				428
1871	373			5	378		185	1	3			2					16				93
1872	396			1	397		160	1	1			2					12				56
1873	206				208		82	1	1			2					9				325
1874	409		2	2	413		185	2				27					12				361
1875	542	1	3		546		214					6					11				57
1876	513		4	1	518		214					35					18				377
1877	615		3	1	620		164					10					15				425
1878	715				715		214					35					16				96
1879	597		6		604		264	2				62					27				481
Totals	8,980	5	323	12	9,320	2,433	739	18	1,316	164	375	709	4	16	1	1	316	83	58		7,756

Note.—Received, 9,320; discharged, 7,756; on hand, 1,564.

TABLE II.

Recapitulation of received and discharged prisoners from July 1st, 1877, to July 1st, 1879.

MONTHS.	Number of prisoner on hand at the close of each month.												
	July	August	September	October	November	December	January	February	March	April	May	June	July
1877.	32	32	47	92	27	48	68	58	44	81	87	46	30
1878.	68	58	44	81	87	46	30	48	61	43	46	52	61
1879.	44	67	55	50	43	41	44	67	55	50	43	41	44
Totals	1,243	53	6	1	1	1	1,319	478	287	51	21	5	1,475
Received by commitment	32	4	6	1	6	1	68	58	44	81	87	46	30
Returned convict witnesses	1	1	1	1	1	1	1	1	1	1	1	1	1
Escapes recaptured	1	1	1	1	1	1	1	1	1	1	1	1	1
Pardons revoked	1	1	1	1	1	1	1	1	1	1	1	1	1
United States prisoners	3	5	1	1	1	1	2	1	1	1	1	1	1
Total receipts	35	16	13	1	1	1	71	66	45	87	90	50	30
Discharged per Act and restored	16	11	12	8	8	10	22	27	18	27	31	25	30
Discharged per Act	13	12	12	8	8	10	19	16	7	19	25	15	12
Taken out by order of Court as witnesses	1	3	4	2	1	5	5	4	4	1	8	4	4
Taken out by order of Court for new trial	1	1	1	1	1	4	1	1	1	1	1	1	1
Discharged by order of Court	1	1	1	1	1	4	1	1	1	1	1	1	1
Discharged by commutation	3	3	3	4	1	3	5	4	4	9	13	10	10
Pardoned by the Governor	2	2	2	2	2	2	2	2	2	2	2	2	2
Pardoned by the President	1	1	1	1	1	1	1	1	1	1	1	1	1
Died	2	1	1	1	1	2	1	1	1	1	1	1	1
Sent to Insane Asylum	1	1	1	1	1	1	1	1	1	1	1	1	1
Discharged by order of United States Commissioner	1	1	1	1	1	1	1	1	1	1	1	1	1
Escaped	1	1	1	1	1	1	1	1	1	1	1	1	1
Total discharged	35	33	31	27	26	37	53	54	37	70	85	58	53
Monthly average	1,318	1,326	1,342	1,413	1,415	1,435	1,453	1,465	1,473	1,490	1,495	1,487	1,464
July	1,318	1,326	1,342	1,413	1,415	1,435	1,453	1,465	1,473	1,490	1,495	1,487	1,464
August	1,326	1,342	1,413	1,415	1,435	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
September	1,342	1,413	1,415	1,435	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465
October	1,413	1,415	1,435	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473
November	1,415	1,435	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
December	1,435	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
January	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
February	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
March	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
April	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465
May	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473
June	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
July	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
August	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
September	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
October	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
November	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465
December	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473
January	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
February	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
March	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
April	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
May	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
June	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
July	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
August	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
September	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
October	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
November	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465
December	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473
January	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
February	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
March	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
April	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
May	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
June	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
July	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
August	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
September	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
October	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
November	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465
December	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473
January	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
February	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
March	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
April	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
May	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
June	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
July	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
August	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
September	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
October	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
November	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465
December	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473
January	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
February	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
March	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
April	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
May	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
June	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
July	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495
August	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487
September	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464
October	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453
November	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465
December	1,495	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473
January	1,487	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1,464	1,453	1,465	1,473	1,490
February	1,464	1,453	1,465	1,473	1,490	1,495	1,487	1					

TABLE II—Continued.

Recapitulation of received and discharged prisoners from July 1st, 1877, to July 1st, 1879.

On hand June 30th, 1877	1,318	
Received from July 1st, 1877, to July 1st, 1879	1,319	
	<hr/>	
Total		2,637
Discharged under the Act	287	
Restored under the Act	478	
Taken out by order of Court as witnesses	51	
Taken out by order of Court for new trial	21	
Discharged by order of Court	5	
Discharged by commutation	115	
Pardoned by the Governor	33	
Pardoned by the President	3	
Died in prison	56	
Sent to Insane Asylum	11	
Discharged by order of United States Commissioner	1	
Escaped from prison	12	
	<hr/>	
Total		1,073
On hand June 30th, 1879		<hr/> 1,564
Increase in two years		246

TABLE III.
Nativity of prisoners.

NATIVITY.	Number.	Per cent.	NATIVITY.	Number.	Per cent.
<i>United States and Territories.</i>			<i>Foreign.</i>		
Alabama	8	.51	Austria	9	.57
Arkansas	8	.51	Australia	3	.18
Alaska Territory	2	.12	British Columbia	1	.06
California	228	14.59	Belgium	1	.06
Connecticut	10	.63	China	267	17.16
Delaware	2	.12	Canada	22	1.43
Florida	4	.25	Chili	7	.44
Georgia	8	.51	Denmark	4	.25
Illinois	29	1.87	England	62	3.98
Indiana	10	.63	France	25	1.59
Iowa	6	.38	Germany	57	3.67
Kansas	1	.06	Greece	5	.31
Kentucky	24	1.55	Guatemala	1	.06
Louisiana	16	1.02	Holland	1	.06
Maine	18	1.15	Ireland	137	8.78
Maryland	17	1.08	Italy	15	.95
Michigan	16	1.02	Mexico	39	2.51
Massachusetts	45	2.90	Malta	1	.06
Missouri	36	2.33	Manilla	1	.06
Minnesota	1	.06	Nova Scotia	3	.18
Mississippi	1	.06	Newfoundland	1	.06
Nebraska	3	.18	New Brunswick	3	.18
New Hampshire	8	.51	Portugal	6	.38
New York	173	11.09	Poland	2	.12
New Jersey	16	1.02	Russia	2	.12
North Carolina	4	.25	Prussia	6	.38
Nevada	1	.06	Sweden and Norway	13	.85
Ohio	27	1.72	Switzerland	8	.51
Oregon	8	.51	Scotland	13	.85
Pennsylvania	38	2.45	Spain	4	.25
Rhode Island	6	.38	Sandwich Islands	1	.06
South Carolina	4	.25	Turkey	1	.06
Tennessee	14	.89	Wales	6	.38
Texas	3	.18	West Indies	2	.12
Utah Territory	1	.06	At sea	2	.12
Vermont	3	.18			
Virginia	15	.95	Total foreign	731	46.80
West Virginia	3	.18	Total United States, carried forward	833	53.20
Wisconsin	10	.63			
Distriet Columbia	3	.18			
New Mexico	2	.12	Total	1,564	100.00
Washington Territory	1	.06			
Total	833	53.20			

TABLE IV.

Classification of crimes.

CRIME.	Number.	CRIME.	Number.
Arson	3	Felony	52
Arson, first degree	6	Grand larceny	301
Arson, second degree	10	Grand larceny and prior conviction ..	9
Attempt to commit arson	4	Grand larceny and house-breaking ..	1
Accessory to murder	1	House-breaking	5
Assault to murder	53	House-breaking and prior conviction ..	2
Assault to rape	18	Incest	3
Assault to rob	38	Kidnaping	1
Assault to rob and prior conviction ..	2	Larceny	3
Assault to murder and grand larceny ..	1	Murder	13
Assault with deadly weapon	23	Murder, first degree	51
Assisting prisoner to escape	1	Murder, second degree	124
Attempt at burglary	28	Manslaughter	50
Attempt at grand larceny	1	Mayhem	1
Burglary	124	Perjury	9
Burglary, first degree	153	Petit larceny and prior conviction ..	8
Burglary, second degree	177	Rape	11
Burglary and felony	2	Robbery	164
Burglary and grand larceny	8	Robbery and prior conviction	7
Burglary and robbery	1	Robbery and assault with deadly weapon ..	2
Burglary and assault to rape	1	Robbery and grand larceny	2
Burglary and prior conviction	8	Robbery and arson	3
Buggery	2	Robbing United States mail	1
Breaking jail	1	Seduction	1
Counterfeiting	18		
Embezzlement	24		
Forgery	31		
Forgery and felony	1	Total	1,564

TABLE V.
Terms of imprisonment.

TERM.	Number.	TERM.	Number.
Six months	3	Nine years	15
Eight months	1	Nine and one-half years	2
Ten months	1	Ten years	129
One year	95	Ten and one-quarter years	1
One and one-quarter years	3	Ten and one-half years	1
One and one-half years	38	Eleven years	6
One and two-third years	2	Twelve years	23
Two years	161	Twelve and one-half years	1
Two and one-quarter years	1	Thirteen years	11
Two and one-half years	34	Fourteen years	19
Three years	180	Fifteen years	41
Three and one-quarter years	1	Fifteen and one-quarter years	1
Three and one-third years	1	Sixteen years	2
Three and five-twelfth years	1	Seventeen years	1
Three and one-half years	38	Eighteen years	7
Three and two-third years	1	Nineteen years	3
Four years	153	Twenty years	19
Four and one-half years	13	Twenty-one years	6
Four and two-third years	1	Twenty-two years	5
Four and three-quarter years	1	Twenty-three years	2
Five years	209	Twenty-four years	3
Five and one-quarter years	1	Twenty-five years	14
Five and one-half years	5	Twenty-seven and one-half years	1
Six years	72	Thirty years	8
Six and one-quarter years	1	Forty years	1
Six and one-half years	3	Forty-five years	2
Seven years	70	Life	97
Seven and one-half years	12		
Seven and three-quarter years	1		
Eight years	40	Total	1,564

TABLE VI.
Age of prisoners.

AGE.	Number.	AGE.	Number.
Fourteen years	2	Forty-three years	15
Fifteen years	5	Forty-four years	20
Sixteen years	11	Forty-five years	19
Seventeen years	18	Forty-six years	31
Eighteen years	33	Forty-seven years	15
Nineteen years	32	Forty-eight years	19
Twenty years	43	Forty-nine years	16
Twenty-one years	58	Fifty years	15
Twenty-two years	71	Fifty-one years	7
Twenty-three years	54	Fifty-two years	7
Twenty-four years	61	Fifty-three years	12
Twenty-five years	82	Fifty-four years	2
Twenty-six years	64	Fifty-five years	12
Twenty-seven years	66	Fifty-six years	11
Twenty-eight years	82	Fifty-seven years	10
Twenty-nine years	57	Fifty-eight years	3
Thirty years	77	Fifty-nine years	6
Thirty-one years	57	Sixty years	8
Thirty-two years	70	Sixty-two years	2
Thirty-three years	50	Sixty-three years	1
Thirty-four years	47	Sixty-four years	3
Thirty-five years	40	Sixty-eight years	1
Thirty-six years	43	Sixty-nine years	2
Thirty-seven years	37	Seventy years	2
Thirty-eight years	39	Seventy-one years	1
Thirty-nine years	33	Seventy-three years	1
Forty years	39		
Forty-one years	24	Total	1,564
Forty-two years	28		

TABLE VII.
Educational abilities of prisoners.

Read and write	1,085
Read and cannot write	21
Neither read nor write	458
Total	1,564

TABLE VIII.

Number of prisoners from each county.

COUNTY.	Number.	Per cent.	COUNTY.	Number.	Per cent.
Alpine	1	.06	San Bernardino	19	1.21
Alameda	63	4.04	San Diego	19	1.21
Amador	9	.57	San Francisco	525	33.63
Butte	38	2.45	San Joaquin	84	5.37
Calaveras	24	1.55	San Luis Obispo	12	.76
Colusa	27	1.72	San Mateo	14	.89
Contra Costa	10	.63	Santa Barbara	13	.85
Del Norte	1	.06	Santa Clara	61	3.90
El Dorado	12	.76	Santa Cruz	18	1.15
Fresno	14	.89	San Benito	17	1.08
Humboldt	14	.89	Shasta	29	1.87
Inyo	3	.18	Sierra	4	.25
Kern	32	2.05	Siskiyou	20	1.27
Lake	5	.31	Solano	25	1.60
Lassen	3	.18	Sonoma	42	2.70
Los Angeles	64	4.08	Stanislaus	14	.89
Marin	7	.44	Sutter	2	.12
Mariposa	7	.44	Tehama	17	1.08
Mendocino	7	.44	Trinity	1	.06
Merced	13	.85	Tulare	23	1.47
Monterey	18	1.15	Tuolumne	9	.57
Nevada	24	1.55	Ventura	5	.31
Napa	25	1.59	Yuba	43	2.75
Placer	22	1.43	Yolo	14	.89
Plumas	5	.31			
Sacramento	86	5.50	Total	1,564	100.00

TABLE IX.

Occupation of prisoners when received.

OCCUPATION.	Number.	OCCUPATION.	Number.
Artist	1	Laborer	648
Baker	13	Lawyer	2
Brickmaker	1	Laundryman	5
Bricklayer	2	Lumberman	1
Book-keeper	15	Moulder	5
Barkeeper	5	Miner	39
Barber	20	Merchant	4
Blacksmith	14	Miller	2
Boiler-maker	4	Marble cutter	1
Boot-black	1	Machinist	6
Brush-maker	1	Milliner	2
Broom-maker	1	Musician	5
Box-maker	1	Oil finisher	1
Butcher	26	Pressman	1
Boat builder	1	Printer	11
Cook	104	Plumber	2
Cineh-maker	1	Peddler	2
Carpenter	31	Patter	1
Cigar-maker	12	Plasterer	4
Clerk	36	Painter	20
Currier	1	Photographer	2
Carver	1	Physician	1
Confectioner	1	Railroad employé	5
Cabinet-maker	3	Railroad agent	1
Coach-maker	1	Ship carpenter	1
Chair-maker	1	Sash maker	2
Cooper	2	Scamstress	6
Cutter	2	School teacher	2
Civil engineer	2	Stone mason	1
Copyist	1	Stevedore	1
Druggist	3	Sailor	48
Dairyman	1	Steward	4
Dentist	1	Servant	5
Dyer	3	Stenographer	1
Engineer	11	Stone cutter	3
Engraver	2	Silversmith	1
Farmer	67	Sport	1
Fisherman	1	Saloon-keeper	4
File cutter	1	Salesman	1
Florist	1	Soldier	2
Fireman	10	Shoemaker	27
Gambler	1	Sawyer	1
Gardener	8	Sailmaker	6
Cas-fitter	3	Teamster	47
Glazier	3	Tobacconist	3
Glass-blower	2	Tailor	19
Gunsmith	1	Telegraph operator	2
Harness maker	4	Tinsmith	4
Hostler	24	Trunk maker	1
Herder	3	Upholsterer	4
Hatter	1	Vaquero	22
Horse-shoer	1	Washman	67
Hotel-keeper	1	Wheelwright	2
Horse jockey	1	Waiter	37
Housekeeper	1	Wagon maker	1
Haek driver	1	Whip maker	1
Iron worker	2	Watchmaker	1
Interpreter	1		
Lather	1	Total	1,564

TABLE X.

Number of terms.

TERM.	Number.	TERM.	Number.
Prisoners serving their first term.....	1,187	Prisoners serving their sixth term....	4
Prisoners serving their second term.....	250	Prisoners serving their seventh term....	2
Prisoners serving their third term.....	82	Total.....	1,564
Prisoners serving their fourth term.....	24		
Prisoners serving their fifth term.....	15		

TABLE XI.

The following are the credits allowed for good conduct, under provisions of an Act to amend Section 1590 of the Penal Code, approved March 29th, 1878.

SENTENCE.	Credits Allowed— Months.	SENTENCE.	Credits Allowed— Months.
Six months	1	Thirteen years	57
One year	2	Thirteen and one-half years.....	59½
One and one-half years	3	Fourteen years	62
Two years	4	Fourteen and one-half years	64½
Two and one-half years.....	6	Fifteen years.....	67
Three years	8	Fifteen and one-half years	69½
Three and one-half years	10	Sixteen years.....	72
Four years	12	Sixteen and one-half years.....	74½
Four and one-half years	14½	Seventeen years	77
Five years	17	Seventeen and one-half years.....	79½
Five and one-half years.....	19½	Eighteen years	82
Six years	22	Eighteen and one-half years.....	84½
Six and one-half years.....	24½	Nineteen years	87
Seven years	27	Nineteen and one-half years	89½
Seven and one-half years	29½	Twenty years	92
Eight years	32	Twenty and one-half years.....	94½
Eight and one-half years.....	34½	Twenty-one years	97
Nine years	37	Twenty-one and one-half years.....	99½
Nine and one-half years	39½	Twenty-two years	102
Ten years	42	Twenty-two and one-half years.....	104½
Ten and one-half years	44½	Twenty-three years	107
Eleven years	47	Twenty-three and one-half years	109½
Eleven and one-half years	49½	Twenty-four years.....	112
Twelve years.....	52	Twenty-four and one-half years	114½
Twelve and one-half years	54½	Twenty-five years	117

TABLE XII.

Statement of clothing, etc., issued to prisoners by Turnkey's Department, from July 1st, 1877, to July 1st, 1879.

DATE.	PANTS.		SHIRTS.		Shoes -----	Hats -----	Blankets -----	Yards of bed tickings -----	Beds -----	Office boots and shoes -----	Repairs -----
	Woolen.	Citizen.	Woolen.	Citizen.							
1877.											
July -----	165	10	156	24	148	90	30	341½	60	15	43
August -----	220	8	206	19	177	109	31	341	76	9	23
September -----	232	4	223	29	153	163	62	341¾	96	6	27
October -----	317	2	303	32	231	134	177	561½	148	13	33
November -----	236	7	229	16	188	84	62	231	41	9	26
December -----	233	1	224	32	182	63	123	329	87	12	63
1878.											
January -----	206	10	193	33	203	80	139	231	92	16	49
February -----	223	17	313	28	201	140	109	215½	67	22	45
March -----	248	4	242	41	212	109	22	322	91	13	41
April -----	300	18	282	41	232	93	112	235½	122	10	49
May -----	288	21	277	55	209	157	57	223¾	141	13	49
June -----	271	32	270	52	255	128	39	227½	81	17	55
July -----	169	13	152	59	215	119	9	279	69	26	30
August -----	289	15	287	48	212	127	35	114½	88	21	33
September -----	267	6	260	27	182	90	106	397½	100	18	24
October -----	245	2	233	31	214	103	84	336	89	17	36
November -----	262	4	258	28	234	127	86	227½	66	13	31
December -----	240	10	238	27	190	76	124	345¾	79	19	19
1879.											
January -----	223	12	217	30	188	83	96	320½	100	17	29
February -----	293	7	288	13	189	80	85	283¾	83	20	27
March -----	315	6	305	40	255	117	75	326½	122	14	31
April -----	256	13	251	69	214	85	70	226½	92	21	10
May -----	305	14	287	35	246	107	92	338½	110	24	21
June -----	211	22	205	84	221	122	57	337½	96	14	21
Totals -----	6,014	258	5,899	893	4,951	2,586	1,882	7,133	2,196	379	815

I remain, respectfully,

CHAS. AULL, Turnkey.

REPORT OF THE MORAL INSTRUCTOR.

REPORT OF THE MORAL INSTRUCTOR.

To the Honorable Board of Directors of the State Prison of California:

GENTLEMEN: The school and library department of the Prison was reorganized and placed under the present management on the 13th day of May, 1878, at which time there were enrolled 54 pupils. The whole number enrolled as members of the Prison school to June 30th, 1879, is 146. The ages of the young men who have been under instruction range from 18 to 22 years; the average age is about 18 years.

The school is divided into five classes, and for each class a competent teacher has been appointed. Great care has been exercised in the selection of teachers. Several had had some experience in teaching previous to their imprisonment, and each has labored faithfully and efficiently in the discharge of the important duties assigned him.

The greater number of the boys enrolled had received but little or no education; 26 were unable to read or write at the time of their commitment; 50 were only able to read imperfectly in the first reader; 52 had some knowledge of the first principles of arithmetic, while but 18 had made that degree of advancement in their studies which might reasonably be expected of boys 12 years of age during one year's regular attendance at any well conducted school.

The nativity of the pupils is classified as follows:

Native born of native parentage	40
Native born of foreign parentage	77
Foreign born	29
Total	146

Nearly all the boys admitted to the school had been convicted of burglary or grand larceny, and sentenced to imprisonment for terms ranging from one to three years. A very large proportion of them appear to have never been subjected to parental control or home training. They had never been given any regular employment, taught to work, or required to attend school.

Thus, free from restraint, permitted to mingle freely with the criminal class, and left without intellectual or moral training, it is no cause for surprise that so many neglected and unfortunate boys become criminals who, under more favorable circumstances, might have become useful members of society.

The boys in general had never attended school a sufficient length of time to derive much benefit therefrom, and had neither the knowledge, the habits, nor the inclinations of scholars; neither had they any just appreciation of the value of mental culture. Under these circumstances their deportment has been better and their advancement greater than we had reason to expect. The intellectual advancement of many has been truly gratifying to all who feel an interest in their welfare.

Mental training has had its usual beneficial influence, and doubtless some improvement has also been made morally as well as intellectually. They have been separated as far as practicable from older

and more hardened criminals, and required to pass each day, under the supervision of the teachers selected, with direct reference to mental and moral characteristics, as well as to their literary acquirements. And while they have been rendered temperate in their habits by necessity; prohibited the use of profane and obscene language; and compelled to present the appearance of sobriety and respectability, some at least have been prepared to carry away with them their acquired good habits, and afterwards to practice through choice the habits at first enforced and afterwards rendered easy and familiar by continued practice.

But while it is true that some good results have been attained, it is also evident that a prison is a very poor place for the moral and intellectual training of children, and it is greatly to be desired that discretionary power be given to magistrates to use other means of punishment than imprisonment in the case of juvenile offenders.

LIBRARY.

The Prison library contains 3,118 volumes, among which are to be found many standard works on history, biography, travels, science, theology, poetry, and general literature. The present collection has been made up principally from donations of books made by the Mercantile, Mechanics' Institute, and Odd Fellows' Libraries, and from private contributions by the friends of prison reform in San Francisco and elsewhere.

A valuable and popular department of the library consists of several hundred bound volumes of magazines. The periodicals contributed and collected from various sources have been assorted, arranged, and bound into volumes in the book bindery connected with the library, where several prisoners have been constantly employed in binding and repairing books.

The statistics of the library for the year ending June 30th, 1879, are herewith presented:

MONTHS OF—	VOLUMES IN LIBRARY, AND ACCESSIONS.						CIRCULATION.				BOOK BINDING	
	Volumes on hand 1st of month.	Accessions re- ceived.	Volumes con- demned.	Total	School books re- ceived.	Nowspapers re- ceived.	Romance and sto- ries.	Bound magazines.	All other classes.	Total	Books repaired.	Magazines bound.
July, 1878.	2,215	68	113	2,170	600	2,080	279	601	326	1,206	—	42
August, 1878.	2,170	36	200	2,006	74	—	486	542	339	1,367	—	15
September, 1878.	2,006	77	—	2,083	140	—	486	514	285	1,285	39	—
October, 1878.	2,083	92	—	2,175	27	1,480	593	512	511	1,416	86	47
November, 1878.	2,175	210	—	2,385	24	694	673	533	387	1,593	44	11
December, 1878.	2,385	113	—	2,498	—	1,114	693	480	409	1,582	83	52
January, 1879.	2,498	24	—	2,522	—	1,050	725	449	396	1,570	63	13
February, 1879.	2,522	190	—	2,712	—	1,349	624	443	469	1,536	9	52
March, 1879.	2,712	12	—	2,724	—	70	709	445	458	1,612	148	7
April, 1879.	2,724	138	—	2,862	—	2,230	775	431	472	1,678	36	10
May, 1879.	2,862	57	—	2,919	—	1,585	898	484	512	1,894	112	—
June, 1879.	2,919	199	—	3,118	—	—	826	507	553	1,886	54	13
Totals.	—	1,226	313	3,118	865	12,353	7,767	5,941	4,917	18,625	614	260

The privileges of the library are extended to all the prisoners who comply with its rules and regulations, and its influence has been highly beneficial. From the want of sufficient employment in the workshops a large proportion of the prisoners have been compelled to spend most of their time in their cells, and to these the privilege of drawing books to give them mental employment is invaluable.

Many have thus acquired a taste for reading, and have become familiar with the works of the best authors; others have made an earnest effort to remedy the defects of their early education, and, with such assistance as was available, have made good progress in their studies; while others have made a special study of some foreign language, or of some branch of natural science, theology, or mathematics, and have added greatly to their knowledge of these different subjects.

The prisoners who have thus availed themselves of the facilities proffered to them have not only improved their tastes and acquired an increased store of knowledge, but have also strengthened their mental powers, and have been in some measure prepared to regain the confidence and esteem of their fellow-men, and to become industrious and useful citizens.

If the library did nothing more than to afford an occasional hour of relief and pleasure to the prisoners it would indeed be doing a good work, but it effects much more than this; the works of the best authors diligently read in most of the prison cells cheer many a sad life with glimpses of other scenes and better things.

RELIGIOUS SERVICES.

The religious services have invariably been attended by as many prisoners as could obtain seats in the chapel. Respectful attention has always been given to the clergymen of different denominations who have volunteered to visit the Prison alternately, and instruct the prisoners in religious truths. Several of these gentlemen have, for many years, been accustomed to visit the Prison regularly, and conduct the religious services, and are highly esteemed by the prisoners. Many appear to have been deeply impressed with the instructions received, and strengthened in their resolutions to return to a course of sobriety and virtuous industry, and encouraged to undertake and make efforts to persevere in an honest way of living.

To the volunteer clergymen, and especially to the General Agent of the Prison Commission, we are greatly indebted for their faithful and punctual attendance at the hour set apart for religious worship, and also for a large supply of books, magazines, and newspapers, collected from various sources and forwarded to the Prison library.

CORRESPONDENCE.

Prisoners have been furnished with stationery without charge, and encouraged to write letters to their friends as often as they have thought necessary. All letters written by prisoners, and also those addressed to them and received at the Prison, have been carefully examined; and the number thus received during the year has averaged about 2,300 a month.

Statement of the amount expended for the transportation of discharged prisoners during the year ending June 30th, 1879.

1878.		1879.	
July -----	\$94 90	January -----	\$150 00
August -----	70 00	February -----	125 00
September -----	57 00	March -----	80 00
October -----	50 00	April -----	85 00
November -----	60 00	May -----	110 00
December -----	90 00	June -----	110 00
		Total -----	\$1,081 90

During the past year, transportation to their former residence or elsewhere has been provided for 206 discharged prisoners, of which number I have been given tickets: 2 to British Columbia; 15 to Oregon; 3 to Washington Territory; 16 to Nevada, and 170 to various points in California.

Respectfully submitted,

C. C. CUMMINGS,
Moral Instructor.

REPORT OF THE PRISON SURGEON AND PHYSICIAN.

MEDICAL DEPARTMENT REPORT.

To the Honorable the Board of Directors for the California State Prison :

GENTLEMEN: In submitting for your consideration my biennial report pertaining to the medical department of the California State Prison, I will glance at certain matters of complaint and suggestions of improvement to be made in its condition, to which your attention was called in my last biennial report. The condition of embarrassment, inconvenience, and annoyance existing at that time, resulting from the preceding disastrous fire, have all, happily, been dissipated by the wisdom and energy of your Board, the liberality of the Legislature in affording the necessary appropriation of money, and the efficient, prudent, and active zeal of the Warden and other officers of the Prison, whose duty it was to bring order out of chaos. As one of the results, the medical department is now amply supplied with all the room required, and all the improvements and matériel called for by me in the report referred to, and also sufficient cell capacity for the accommodation of all the convicts. Notwithstanding so much has been accomplished, and the time and energy of those properly in charge has been taxed at all times to their full capacity, there still remains unprovided for the matter of the guards' quarters, which was referred to by me in my last report in the following words:

The sleeping apartments assigned to the night guards are not sufficient in space or ventilation for the demands of health, and the main draught of air that reaches them is blown over the surface drainage of the kitchen and a contiguous lot of old decaying shed-rooms about two hundred feet in length, that stand against the outside of the south part of the east prison wall, their contents adding to the impurity of the atmosphere. It is necessary that these sleeping rooms should be less crowded and better ventilated, and that the old buildings referred to, together with the officers' water-closet, be removed, and that different arrangements be made for the vegetable depot, which at present is one of the shed-rooms mentioned.

Occupying a position that necessarily brings me in close contact with the convicts, affording me ample opportunity for observation, and influencing only in a slight degree their management, control, and discipline, being to some extent an independent observer, it is with pleasure, not divested entirely of pride, I notice that there has been a marked and very great improvement effected during this administration in the discipline and government of the Prison, and the disposition of the prisoners. This happy state of affairs is due to the attention given to the subject by the Directors, the efficiency and the humane disposition of the Warden, and the energy and zeal of the officers in the discharge of their respective duties. An important factor in producing this desirable change, is the introduction of the system of credits for good behavior provided for in a law of the last Legislature, commonly known as the "Goodwin Bill." The operation of this law effected a marked change for the better in the deportment of the convicts, and therein greatly aided the officers in enforcing discipline and lessening at once the number of cases necessitating corporal punishment, and resulted also in improving their sanitary condition, for it is a well known fact that the mental status of the prisoners materially affects the vital organs, and that the death rate and disability list is influenced greatly by a tendency to cheer-

fulness, contentment, etc. From observations of its practical effects, it is evident to me that it is an excellent law, happy in its influence for good, and lessening positively the arduous labors of the officers whose duty it is to maintain order and enforce discipline, accomplishing all these ends without producing that degree of degradation which educates convicts to become utterly outlaws and desperadoes.

I have to report a great change for the better in the habits of the convicts in reference to the loathsome and degrading crime of self-abuse and its kindred associations, which I referred to in my last report as prevailing at that time, from which the following is an extract:

The great evil presenting for remedial action in prison life is self-abuse, a vice that undermines the constitution and debases the moral instincts more than all other causes combined. It kills body and soul; and if the subject of this vice is so fortunate as to serve out his sentence, he returns to the community a fit subject to adopt crime as a profession for life. This disgusting vice exists as a primary cause of the principal diseases with which convicts are afflicted, and to repair the resulting injury is the principal study of the Prison Physician; and its eradication is also of primary importance in a moral point of view.

This change is marked, and the number of cases now presenting for medical relief, from the vice itself and injuries resulting physically and mentally therefrom, have very materially lessened.

From the accompanying tables, to which your attention is called, it is apparent that the health of the Prison has been excellent, and that there is a remarkable degree of exemption from diseases common to cell life, originating from blood poisoning called zymotic, and also of malarial origin, the few cases occurring of this class having received the germs of disease before their arrival here. But there has been an increase in the number of chest diseases, and the death rate from this cause has been augmented. This is mainly caused by the sudden change of temperature, produced by the removal of the convict from the close air of the cells to the cool atmosphere which is common here in the early morning. As a rule in these cases, the subject visits me suffering from a cold, more or less severe, affecting the first air passages. The same cause of disease still operating, the case may present itself with chronic inflammation of the larynx, pharynx, or trachea, some one or more of these organs, which by easy grades passes to chronic bronchitis, and finally terminating in bronchial consumption. But by reference to the column of unclassified diseases, which is mainly made up of cases of this character, it appears that the ratio of cases originating from this cause is exceedingly low. The remedy for this state of affairs would be the confinement of the prisoners in their cells until a late hour in the morning, a thing which is impracticable in a work-prison.

By reference to accompanying tables you will see that the ratio of deaths to all reported cases of sufficient magnitude to require medical attention, is 1 per cent., and to those which were diagnosed and classified $2\frac{4}{100}$ per cent. All cases that were aggravated at their inception or then indicated such condition during their anticipated course, and all persons who were physical "wrecks" at the time of their reception in the Prison were treated in the hospital, consequently the ratio of deaths for those treated in the hospital only, gives no practical indication of the sanitary condition of the Prison. The death rate of this class of cases is 25 per cent.

The question affecting the best manner of conducting a Prison is

one of magnitude, requiring for its solution great experience and thorough practical knowledge of the subject in all its bearings, and will probably, for many years, like the tax question, be antagonized by diversified views. Persons generally of the least experience will give tone to public opinion and shape legislation in the premises. In the discussion of this subject, two antagonizing ideas are generally advanced—one of which contemplates a course of discipline, having as an objective point the infliction of misery, degradation, and shame in the extreme—thus dissipating the last relic of humanity in the subjects and degrading them to the level of the brute creation. The other, from an opposite standpoint, are influenced by a maudlin sympathy, affecting them to such a degree that they would condone all crimes, and, in fact, impress into the minds of the convicts the idea that they were a badly misused class, improperly deprived of their liberty, and that a system which holds to punishment following conviction for crime is morally and radically wrong—thus advancing doctrines which, if prevalent, would be utterly subversive of all government and equally as detrimental in its effects on communities and the family circle, where it would become the germ for misdemeanor and the progenitor of crime.

I do not intend to attempt the task of reconciling these discordant ideas, or of suggesting a happy medium, if there be one, or of offering a solvent for the subject matter, but will content myself with a short reference to some of the bearings of the question that pertains more particularly to the medical department. It is apparent to me that the aggregation of convicts as practiced in this Prison, and which is necessarily unavoidable from the construction of the Prison buildings, and the system of labor utilized, is clearly injurious to their health and morals, renders the duty of enforcing discipline more arduous, and is disastrous in its effects on every phase of the question of reformation. On the other hand, the silent non-intercourse system affords punishment not accompanied by the degree of degradation which accompanies the present plan. It avoids the general recognition and familiar acquaintance of one with the other, and *carnal intercourse*, which is detrimental to health and morals, and prevents identification elsewhere, which is so prolific of evil to those who leave here with serious intention of reforming.

I favor, then, the silent, non-intercourse single cell plan generally, and for this Prison as near approach to the same as the exigency of the case will admit, as a promoter of health and morals, and a preserver of self-esteem and manhood, and the germs of virtue, which are found in all who are not totally depraved, these principles being essential ingredients in the consideration of the question of reformation.

All of which is most respectfully submitted.

J. E. PELHAM, M. D.,
Surgeon and Physician of State Prison.

SAN QUENTIN, July 1st, A. D. 1879.

DATE.	Phthisis pulmonalis.	Bronchial consump- tion	Pleuritis	Pneumonia	Other diseases of respi- ratory organs.	Influenza	Catarrh	Diarrhoea	Other diseases of stom- ach and bowels.	Hemorrhoids	Diphtheria	Rhenmatism	Periodic rheumatism	Lumbago	Intermittent fever	Remittent fever	Typhoid fever	Diseases of liver	Functional disease of heart	Structural disease of heart	Bright's disease	Disease of kidneys	Secondary syphilis
Quarter ending September 30th, 1877	3	1	2	1	17	10	9	98	2	9	—	23	3	3	15	2	—	5	8	2	—	—	6
Quarter ending December 31st, 1877	5	1	1	1	34	13	3	58	3	12	—	32	2	4	20	5	—	—	9	3	—	—	1
Quarter ending March 31st, 1878	2	8	1	1	15	3	8	17	3	3	—	20	1	4	10	—	—	2	5	1	1	—	6
Quarter ending June 30th, 1878	2	9	1	14	17	72	7	3	6	3	—	23	1	5	12	2	—	3	7	5	—	2	6
Quarter ending September 30th, 1878	4	3	—	1	4	20	4	86	1	6	—	31	—	9	7	—	—	3	7	—	—	5	4
Quarter ending December 31st, 1878	6	6	—	1	3	6	5	40	7	6	—	36	—	3	1	—	—	2	3	4	1	—	4
Quarter ending March 31st, 1879	8	—	—	2	5	8	7	29	8	7	—	34	—	6	1	—	—	3	—	—	—	—	9
Quarter ending June 30th, 1879	2	1	—	2	10	—	7	76	3	5	—	30	—	6	12	—	4	—	2	6	—	1	7
Totals	24	36	4	23	105	132	50	485	29	54	3	229	7	40	80	10	5	17	41	21	2	13	44

DATE.	Other diseases of genito-urinary organs	Stricture	Diseases of skin	Diseases of arteries and veins	Diseases of nerves	Ascaris lumbrico- ides.	Fracture	Contusions, sprains, and wounds	Suicide	Tumors	Paralysis	Cerebro-spinal meningitis	Eye diseases	Hernia	Ascari- dies	Erysipelas	Insanity	Scrofula	Abcess	Poison	Concussion of spine	Leprosy	Unclassified*
Quarter ending September 30th, 1877	3	—	2	5	5	1	—	71	—	2	4	1	1	—	—	—	—	—	—	—	—	—	372
Quarter ending December 31st, 1877	2	—	3	2	14	—	2	57	—	4	4	—	4	3	—	—	1	—	—	—	—	—	320
Quarter ending March 31st, 1878	2	—	4	1	13	—	—	27	—	—	—	—	—	—	—	—	—	1	2	—	—	—	372
Quarter ending June 30th, 1878	12	3	—	2	7	1	—	63	—	—	—	4	—	3	—	—	1	1	2	—	—	—	406
Quarter ending September 30th, 1878	6	2	—	—	9	—	—	49	1	3	3	—	—	2	—	—	4	1	1	1	—	—	408
Quarter ending December 31st, 1878	4	2	3	3	5	—	—	43	1	—	—	—	—	—	—	—	2	4	2	—	—	—	620
Quarter ending March 31st, 1879	5	2	—	2	9	—	—	71	—	—	—	—	—	3	4	—	5	1	2	—	—	—	489
Quarter ending June 30th, 1879	—	—	—	—	21	—	—	55	—	3	3	—	—	1	—	—	—	1	2	—	—	—	385
Totals	34	9	12	15	83	2	2	436	2	12	17	1	9	12	8	14	13	7	11	1	1	1	3,372

* Unclassified diseases embrace cases of indisposition requiring prescription, but of so light a character as not to demand at the time a diagnosis, and mainly dependent upon derangement of the first air passages and chlo-pototic organs.

DEATHS.

Nativity.	DISEASE.	Date.
Irish	Congestion of lungs	July 3, 1877.
Chinese	Phthisis pulmonalis	July 30, 1877.
Chinese	Chronic Bronchitis	August 10, 1877.
Chinese	Paralysis	September 16, 1877.
American	Congestion Pulmonalis	September 23, 1877.
Chinese	Chronic bronchitis	September 26, 1877.
Indian	Phthisis pulmonalis	October 3, 1877.
American	Dysentery	November 12, 1877.
Irish	Chronic bronchitis	December 13, 1877.
American	Chronic bronchitis	December 13, 1877.
Indian	Chronic bronchitis	January 14, 1878.
American	Pulmonary gangrene	February 10, 1878.
Irish	Bronchial consumption	March 6, 1878.
German	Bronchial consumption	March 24, 1878.
Spanish	Bronchial consumption	March 25, 1878.
American	Bright's disease of kidneys	March 29, 1878.
American	Bronchial consumption	March 31, 1878.
American	Bronchial consumption	April 1, 1878.
Spanish	Bronchial consumption	April 8, 1878.
Irish	Hydro thorax	April 20, 1878.
American	Bronchial consumption	May 5, 1878.
American	Bronchial consumption	May 21, 1878.
American	Pneumonia	May 24, 1878.
Chinese	Phthisis pulmonalis	May 30, 1878.
American	Phthisis pulmonalis	June 1, 1878.
Spanish	Bronchial consumption	June 4, 1878.
Indian	Typhoid pneumonia	June 9, 1878.
Spanish	Pneumonia	June 10, 1878.
Indian	Phthisis pulmonalis	July 2, 1878.
American	Concussion of spine	July 15, 1878.
American	Bronchial consumption	July 26, 1878.
American	Anasarca	July 27, 1878.
Chinese	Scrofula	July 29, 1878.
American	Paralysis	August 5, 1878.
American	Phthisis pulmonalis	September 7, 1878.
American	Strangulation (felo de se)	September 17, 1878.
Chinese	Strangulation (felo de se)	October 9, 1878.
American	Chronic rheumatism	October 31, 1878.
American	Splenitis	October 30, 1878.
Indian	Bronchial consumption	November 10, 1878.
Spanish	Bronchial consumption	November 17, 1878.
Chinese	Bronchial consumption	December 1, 1878.
Indian	Bronchial consumption	December 18, 1878.
Indian	Bronchial consumption	January 22, 1879.
American	Phthisis pulmonalis	January 26, 1879.
American	Typhoid fever	February 23, 1879.
American	Bright's disease of kidneys	March 2, 1879.
American	Typhoid pneumonia	March 2, 1879.
Spanish	Pneumonia	March 16, 1879.
American	Typhoid pneumonia	March 27, 1879.
Spanish	Consumption	April 4, 1879.
Indian	Scrofula	April 27, 1879.
Indian	Scrofula	May 9, 1879.
American	Consumption	June 9, 1879.
American	Consumption	June 17, 1879.

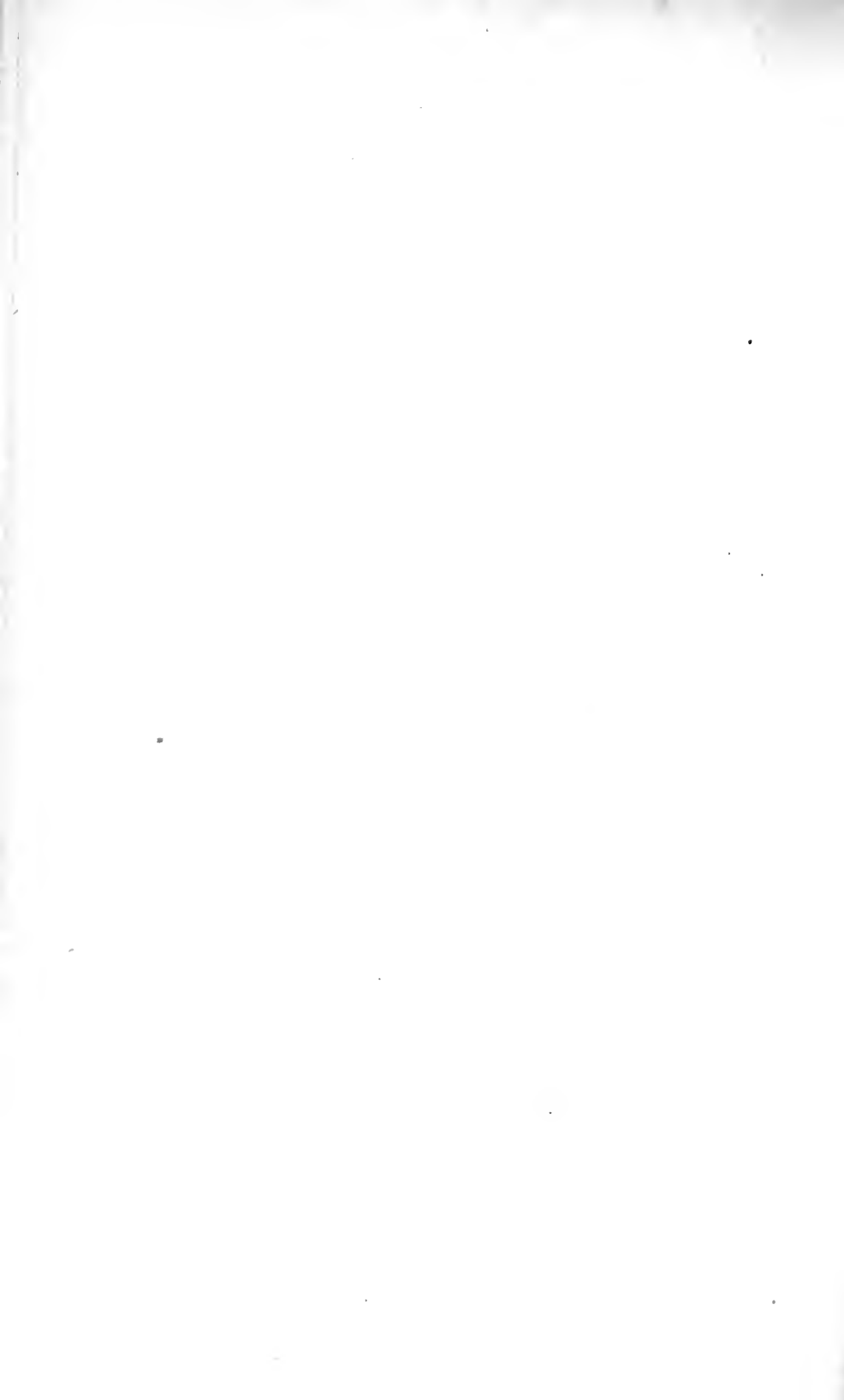
RECAPITULATION OF DEATHS.

DISEASE.	Number.
Conjestion of lungs	2
Phthisis pulmonalis	7
Chronic bronchitis	5
Paralysis	2
Disentery	1
Pulmonary gangrene	1
Bronchial consumption	15
Bright's disease of kidneys	2
Hydro thorax	1
Pneumonia	3
Typhoid pneumonia	3
Concussion of spine	1
Anasarca	1
Scrofula	3
Strangulation (fele de se)	2
Chronic rheumatism	1
Splenitis	1
Typhoid fever	1
Consumption	3
Total	55

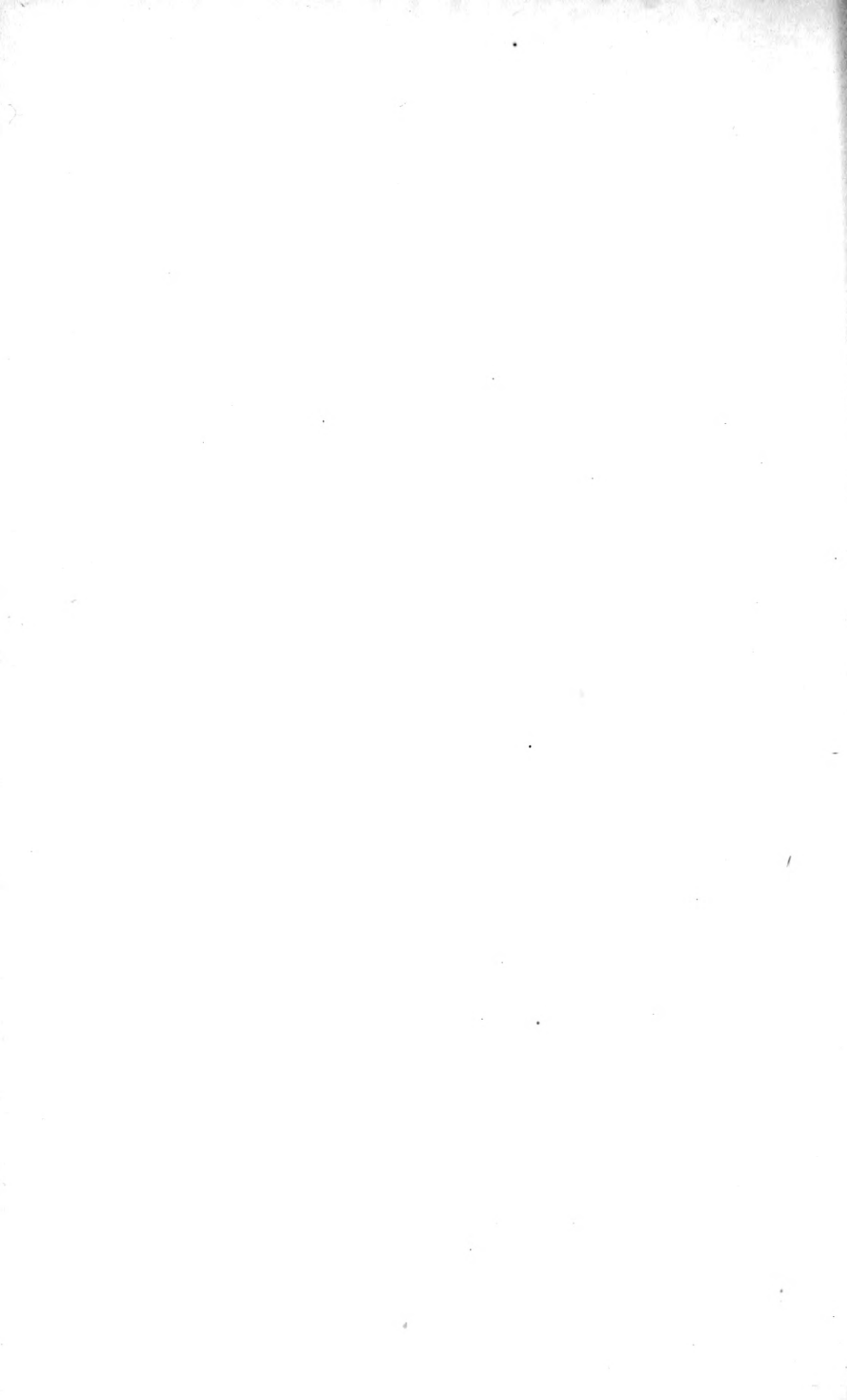
Number of prisoners	1,475 ³ / ₄
Percentage of deaths to classified diseases	2.64
Percentage of deaths to sick	1.00
Percentage of deaths to number admitted to hospital	25.00

SURGEON'S BIENNIAL REPORT OF CALIFORNIA STATE PRISON, ENDING JUNE 30TH, 1879.

	Quarter ending September 30, 1877	Quarter ending December 31, 1877	Quarter ending March 31, 1878	Quarter ending June 30, 1878	Quarter ending September 30, 1878	Quarter ending December 31, 1878	Quarter ending March 31, 1879	Quarter ending June 30, 1879	Total for the two years
Patients treated inside hospital	63	54	68	96	69	71	73	62	556
Patients treated outside hospital	622	578	465	692	618	760	650	587	4,972
Total	685	632	533	788	687	831	723	649	5,528
Patients admitted into hospital	20	27	26	37	29	27	26	31	223
Patients discharged from hospital	15	23	18	31	18	18	12	16	151
Number of deaths	8	3	12	10	7	6	7	2	55







BIENNIAL REPORT

OF THE

Board of State Harbor Commissioners

FOR

THE TWO FISCAL YEARS ENDING JUNE 30, 1879.

REPORT.

Hon. William Irwin, Governor of the State of California :

In compliance with Section 2537 of the Political Code, the Board of State Harbor Commissioners submit their report for the two fiscal years ending 30th June, 1879.

The details appear in the tabular statements hereto annexed. The following is a summary of them :

RECEIPTS.

For dockage, wharfage, tolls, and rents.....	\$895,072 28
For dredging done for private parties.....	16,543 60
For materials sold, etc.....	1,321 49
Total	<u>\$912,937 37</u>
From which it appears that the average monthly receipts from dockage, wharfage, tolls, and rents have been	\$37,294 68

The receipts for the past two years—the rates being the same—are greater than for any like period since the organization of the Board.

They exceed those of the two years ending

30th June, 1873	\$527,575 76
30th June, 1875	273,686 59
30th June, 1877	92,771 38

DISBURSEMENTS.

The various items of the tabular statement may be grouped under the following heads:

Salaries of Commissioners, Secretary and Assistant Secretary, Engineer, Assistant Engineer, and Draughtsman, Attorney, Wharfingers, Collectors, and Watchman...	\$161,171 47
Construction, including building of new wharves, sheds, and sewers, maintenance and repairs of outer half of water front, and old streets, wharves, building and furniture of wharf offices.....	278,849 04
Dredging: Cost of new tug-boat, dredger and scows, and fire-pumps and hose.....	86,613 13
Wages of men, repairs of tug-boats, dredgers, and scows, and cost of coal and water...	98,669 08
Wharf cleaning.....	4,971 23
Sea-wall construction.....	111,895 25
General expenses, including office rent, fuel, stationery, printing, removal of obstructions in the harbor, and other small items.....	15,352 99
Total	<u>\$757,522 19</u>

Deduct from the total disbursements the following items which represent fixed capital, viz.:

Construction of new wharves, sheds, sewers, wharf offices, etc.....	\$227,387 50
New tug-boat, dredger and scows, and fire-pumps and hose.....	86,613 13
Construction of sea-wall.....	111,895 25
Total	<u>\$425,895 88</u>

The balance of \$331,626 31 will represent the current expenses of the two past years, showing a monthly average of about \$13,817 76.

Thus, by comparison of the average monthly receipts with average monthly expenses, it appears that about \$23,476 91 is remitted monthly to the State Treasurer and placed to the credit of the Harbor Improvement Fund.

HARBOR IMPROVEMENT FUND.

Amount to its credit 30th June, 1877-----	\$332,309 93
Remitted from that date to 30th June, 1879-----	559,892 37
Total-----	<u>\$892,202 30</u>
Drawn from the fund from that date to 30th June, 1879-----	404,477 19
Amount to credit of fund 30th June, 1879-----	<u>\$487,725 11</u>

It will be found that the Treasurer's statement of the amount to the credit of the fund does not agree with the above figures, because \$12,098 98 of the receipts of June, 1879, did not reach him till July 2d, after the closing of his biennial accounts. It is only until all the monthly settlements at this office are made that the balance can be remitted to the State Treasurer.

NEW WORK DONE AND ITS CONTRACT COST.

Three ferry slips commenced prior to and completed since June 30th, 1877. The total cost was \$96,990, of which \$31,758 was paid during the period covered by this report. Two of them are occupied by the Central Pacific and the other by the South Pacific Coast Railroad Companies.

Three sheds over the aprons of the above slips. Cost, \$1,494.

Extension of Broadway wharf 503 feet in length and 80 feet in width, to the pier head line. Cost, \$19,823.

Shed over such extension. Cost, \$6,295.

Berkeley ferry slip and shed. Cost, \$1,026 20.

Union Street wharf. It extends 400 feet from the old wharf, part of which is utilized to the pier head line, and is 80 feet wide. Cost, \$17,060.

Davis Street, between Broadway and Vallejo, widened forty feet for a length of 283 feet. Cost, \$3,102 85.

Shed in front of South Pacific Coast Railroad Company ferry. Cost, \$3,970.

Fishermen's wharves, between Vallejo and Green Streets, inclosing a dock 250 feet in length, 50 feet wide at its entrance and 170 feet wide on the line of Front Street. Cost, \$1,100.

Shed on Spear Street wharf, 360 feet long and 65 feet wide. Cost, \$2,973 40. It was afterwards removed at a cost of \$1,050 on to the extension of Spear Street wharf. It was intended for the accommodation of the Oregon steamships, and covers one of the wharves next alluded to.

Dry dock slips and wharves. This work consists of three piers, respectively 450 feet long by 80 feet wide, 290 feet long by 27 feet wide, and 450 feet long by 40 feet wide. The slips between the piers are respectively 89 and 84 feet wide. They are occupied by the Merchants' Dry Dock Company, which surrendered its leased premises at North Point. Cost of these structures was \$33,514 18.

Suspended sewer. It extends along East Street 640 feet, and thence 695 feet under and to the end of the wharf south of the Market Street ferry slips. It is 5½ feet square on the inside and furnished with gates for flushing. It intercepts and discharges the sewers of Market, Sacramento, Commercial, and Clay Streets and other sewers discharging into them. Its cost was \$9,811 06.

A wharf on the south side of Channel Street, between Kentucky and Fourth Streets, 30 feet wide by 810 feet long, was contracted for at a cost of \$9,000. The work, however, was stopped by an injunction at the suit of the Central Pacific Railroad Company, after an expenditure of but \$300. The suit is still pending.

A wharf at the junction of Fifth and Channel Streets, 80 feet long by 20 feet wide. Cost, \$645.

Shed in front of the Saucelito ferry slip. Cost, \$1,722.

Green Street wharf. It extends 639 feet from the old wharf, part of which is utilized to the pier head line, and is 80 feet wide. Cost, \$27,994.

Vallejo Street wharf. It extends to the pier head line, and is 753 feet long by 80 feet wide. The contract price is \$32,658 68. But \$7,000 had been paid up to the 30th of June, 1879. Since then it has been finished and paid for.

Sea-wall—Section No. 1, extending westwardly from the east line of Kearny Street 1,000 feet in length by 91 feet wide. Cost, \$96,000.

Section No. 2, extending eastwardly from the east line of Kearny Street 1,000 feet in length by 91 feet in width. Estimated cost, \$113,000.

On this work there had been paid up to the 30th of June, 1879, as follows: On Section No. 1, \$60,894 15; on Section No. 2, \$29,942 32.

East side of Kearny Street, from Bay Street to the sea-wall, filled to the official grade. Cost, \$11,975.

SEA-WALL.

On 13th September, 1878, a contract was made for the construction of a section of the sea-wall extending from the east line of Kearny Street 1,000 feet westward, at a cost of \$96,000. It is known as Section No. 1. It was finished on 24th July, 1879.

On 1st October, 1878, a contract was made for the extension of the easterly half of Kearny Street, from Bay Street to the sea-wall, at a cost of \$11,975. This work was necessary to enable the contractor to carry his rock and earth out to the sea-wall line, and its cost was chargeable to the State, as all the land on the east side of Kearny Street, between Bay Street and the sea-wall, belongs to the State. When the sea-wall is completed at that point the westerly half of Kearny Street must be constructed by the property owners.

On 5th November, 1878, a contract was made for the construction of Section No. 2, extending from the east line of Kearny Street 1,000 feet eastward. On account of the uncertain character of the bottom along the line of this section it was found necessary to let it by the cubic yard. The price contracted for was \$20,000 for the wharf, 46 cents for stone and 20 cents for earth per cubic yard, measured in the work. This section (at the date of this report) is nearly completed, and its cost will be about \$113,000.

On 25th January, 1879, a contract was made for the construction of a third section, extending from the second section southeasterly

1,000 feet. This was for a like reason let by the cubic yard at 65 cents for stone and 25 cents for earth per cubic yard, and \$20,000 for the wharf. The work on this section has not been begun. The contractor was enjoined from doing any work at the suit of an owner of a lot fronting on the water front line established by Act of the Legislature of 26th March, 1851, who denies the right of the State to change that line, at least without compensation for the damage he alleges he will suffer from the change. The case was argued in the Supreme Court at the May Term, 1879, but (at this date) has not yet been decided. But for this injunction the third section would now be nearly completed.

These contracts were let for only 91 feet in width. The Board, however, on further reflection concluded to widen out Sections Nos. 1 and 2 to the full legal width of 200 feet.

They, therefore, made a contract on 27th August, 1879, for widening Section No. 1 at $29\frac{9}{10}$ cents per cubic yard of earth; and another contract, on 27th August, 1879, for widening Section No. 2, at 30 cents per cubic yard of earth. This work is now under way.

As directed by Section 2536, Political Code, the Governor and Mayor of the City of San Francisco have conferred with the Board in relation to all this work, and the contracts have been made with their consent. The contracts have been let to the lowest bidder in the manner directed by the statute.

It is much to be regretted that the work has been stopped by the litigation referred to, as there are ample means for its prosecution, and many idle hands wanting employment. If the case referred to should reach the United States Supreme Court, as it may do, the further construction of the sea-wall may be delayed for some time. The Board, foreseeing the probability of such litigation, suggested in their last biennial report that some legislative action be had to settle the controversy with the owners of the water-front property "in conformity with sound legal principles and with due regard for the rights of those to be affected by the change." That suggestion is repeated.

DREDGING.

The last biennial report stated the necessity and reasons for further dredging capacity. Since then a new tug-boat, dredger, and scows have been constructed, and have found constant employment. For the two years ending June 30th, 1879, 1,267,533 cubic yards have been dredged at a cost of \$98,669 08, or $7\frac{7}{10}$ cents per cubic yard. For a like period ending June 30th, 1877, 622,835 cubic yards were dredged at a cost of \$56,616 22 or $9\frac{9}{10}$ cents per cubic yard.

These figures include every item of expense connected with the dredging department.

The dredged mud is discharged by the scows in not less than fifteen fathoms of water, to the northwest of Yerba Buena Island. This has been the dumping ground for many years, and such is the strength of the tidal current at that point that repeated soundings show no shoaling. The soft material is dissipated before reaching the bottom. About 80,000 cubic yards have been deposited on the inner side of Section No. 1 of the new sea-wall. Wherever the depth of water will permit the loaded scows to pass behind the wall this plan will be pursued, for the obvious reason that just so much mud is entirely removed from the harbor, and is also utilized as filling.

The shoaling of the docks is produced by several causes, over but one of which the Board has any control, namely, the wash from the streets through the sewers. To obviate this a system of large sewers with flushing gates has been devised by the Chief Engineer, which, on proper lines, will intercept the city sewers near the water-front. They are to be suspended to the frame-work of the wharf and be continued out until they reach the pier head line, where the strong tidal current will sweep away their discharge. One of these has been constructed. It extends 640 feet along East Street, from Clay Street to the wharf south of the South Pacific Coast Railroad ferry slip, and thence 695 feet under that wharf to its end. In its course it intercepts the sewers of Clay, Commercial, Sacramento, and Market Streets, with gates at the points of junction for retaining the water at high tide and discharging it at strong ebb. A similar sewer is about to be constructed under Washington Street wharf, which will intercept the sewers of Washington, Jackson, and Pacific Streets; another will be constructed so as to intercept the sewers of Mission, Howard, and Folsom Streets. These sewers will drain the city from Pacific to Folsom Street, and, it is believed, will also materially improve the health of that part of it.

ENGINEER WORK.

A good deal of this has been done during the past two years. To ascertain the depth of water and character of the bottom along the line of the new sea-wall 2,372 soundings and 260 borings have been taken between Powell and Pacific Streets, and laid down on the maps of the office. Repeatedly during each month cross-sections of the sea-wall in process of construction have been made and delineated on the working plans. Every new wharf structure, with detailed drawings and description, date of construction, etc., has been carefully entered on the Engineer's Register, to serve as a guide to future work.

WHARF CLEANING.

The Board has organized a corps of sweepers, which consists of three men and one horse and cart. The cost is \$220 per month, and the wharves are kept in good condition even with this moderate force.

PROTECTION AGAINST FIRE.

Both the tug-boats belonging to the Commission have been furnished with fire pumps and apparatus, and are kept ready for service. One boat can throw eight and the other two streams of water of equal volume with the city fire engines. They rendered service in the following instances:

1878.

July 4th. Three alarms were answered.

August 2d. Fire in coal-oil store-house at Union and Front Streets; subdued in thirty minutes.

August 19th. Attended fire on Main Street wharf

August 28th. Fire on Front Street wharf; subdued in thirty minutes.

October 15th. Brig Violet; her cargo being on fire, was towed in

and beached in Mission Bay. The fire extinguished by the use of six streams.

October 16th. Answered alarm from Pacific Mail Steamer docks.

October 19th. Answered alarm from Meiggs' wharf.

October 22d. Extinguished in a few minutes fire on the tug-boat Water Witch.

October 29th. Hay on fire on Front Street wharf; subdued in fifteen minutes; three hours' pumping required to totally extinguish it.

November 8th. Dry dock at North Point on fire; extinguished in twenty minutes.

December 2d. Answered alarm from Howard and Main Street wharves.

1879.

January 18th. Cargo of coal of ship River Nith on fire; ran alongside of her; turned in eight streams; pumped three hours; extinguished the fire and saved ship and cargo.

January 18th. Answered alarm from Washington and Davis Streets.

March 24th. Answered alarm from Box 32.

May 11th. Answered alarm from Box 32.

May 11th. Answered alarm from Box 59.

May 17th. Answered alarm from Box 32.

LITIGATION.

The annexed report of the Attorney of the Board will show the character of the litigation in which the Board has been engaged. It has arisen mainly out of their effort to enforce the collection of the revenue along the southern part of the water-front.

WM. BLANDING,

BRUCE B. LEE,

A. M. BURNS,

Commissioners.

October 28th, 1879.

TABULAR STATEMENTS.

TABLE A.

Board of State Harbor Commissioners' Biennial Report, showing the Receipts and Disbursements for the two fiscal years ending June 30th, 1879.

RECEIPTS.

	1877-8.	1878-9.	Total.
Montgomery and Francisco wharf	\$3,906 95	\$2,877 45	\$6,784 40
North Point and Eureka wharves	8,782 20	12,550 80	21,313 00
Battery Street wharf	7,418 45	9,155 30	16,573 75
Front and Union Street wharves	18,703 15	28,709 61	47,412 76
Green and Union Street wharves	29,086 52	19,802 05	48,888 57
Vallejo Street wharf	20,282 26	22,611 04	42,893 30
Broadway Street wharf	19,937 99	27,732 55	47,670 54
Pacific Street wharf	33,962 35	31,414 70	65,377 05
Jackson Street wharf	22,658 95	25,781 15	48,440 10
Washington Street wharf	30,747 22	32,539 50	63,286 72
Oakland ferries	49,433 76	77,294 95	126,728 71
Mission Street wharf	18,528 35	22,475 02	41,003 37
Howard Street wharf	9,763 95	10,035 86	19,799 81
East Street ferry to Howard Street wharf	5,729 87	12,895 51	18,625 38
Folsom Street wharf	16,063 60	16,834 10	32,897 70
Harrison and Spear Street wharf	22,141 40	21,377 82	43,519 22
Main Street wharf	14,486 45	21,995 60	36,482 05
Second and Berry Street wharf	2,887 45	2,759 15	5,646 60
Channel Street wharf	3,823 90	2,993 25	6,817 15
Channel Street "South" wharf	4,071 05	4,946 75	9,017 80
East Street commutation tolls	9,575 00	-----	9,575 00
Stuart Street wharf	1,200 00	1,200 00	2,400 00
Union Lumber Association	4,800 00	4,800 00	9,600 00
Pacific Mail Steamship Company	21,250 00	15,000 00	36,250 00
Central Pacific Railroad	30,299 40	29,647 90	59,947 30
Merchants' Dry Dock	3,300 00	3,300 00	6,600 00
United States Barge Office, Front Street	240 00	240 00	480 00
Space for buildings	6,550 00	2,250 00	8,800 00
Space for scales	415 00	551 50	966 50
Ticket redemption	400 00	-----	400 00
Legal expense	10 00	-----	10 00
Urgent repairs: Sale of old iron, lumber, etc.	276 00	153 89	429 89
Construction Account: Sale of old shed	40 00	-----	40 00
Steam Dredger Expense Account: Received for dredging	16,543 60	-----	16,543 60
Steam Dredger: Amount received, plans, and specifications	150 00	-----	150 00
Expense Account: Amount received, rent of office	300 00	187 50	487 50
Profit and Loss: Sale of old schooner	40 00	-----	40 00
Chief Engineer's Salary and Expense Accounts: Amount returned by T. J. Arnold	86 50	-----	86 50
Tug "Governor Irwin"—sale of maple lumber	-----	67 50	67 50
Dredger No. 1—sale of old iron	-----	10 10	10 10
Wharf south of ferries	8,625 50	2,250 00	10,875 50
	\$446,516 82	\$466,420 55	\$912,937 37
San Francisco Harbor Improvement Fund: Amount drawn	162,712 80	241,764 39	404,477 19
			\$1,317,414 56

TABLE A—Continued.

DISBURSEMENTS.

	1877-8.	1878-9.	Total.
Salaries of Wharfingers, Collectors, and Watchmen.....	\$47,810 45	\$60,931 02	\$108,741 47
Salaries of Commissioners and Secretaries.....	13,200 00	12,200 00	25,400 00
Salary of Attorney.....	2,400 00	2,400 00	4,800 00
Salaries of Chief Engineer and Assistant.....	6,622 00	6,008 00	12,630 00
Salaries of Chief Wharfingers and Assistant.....	4,800 00	4,800 00	9,600 00
Expense Account: Rent, fuel, stationery, etc.....	6,069 60	6,187 79	12,257 39
Urgent repairs.....	23,979 38	27,182 16	51,161 54
Construction Account.....	88,649 57	137,378 39	226,027 96
Steam Dredger Purchase Account.....	82,068 79	3,948 84	86,017 63
Steam Dredger General Expense Account.....	27,016 32	-----	27,016 32
Dredger No. 1, running expenses.....	3,323 32	16,718 35	20,041 67
Dredger No. 2, running expenses.....	3,702 51	18,791 37	22,493 88
Tug "Anasha," running expenses.....	2,032 78	10,466 19	12,498 97
Tug "Governor Irwin," running expenses.....	2,139 47	14,478 77	16,618 24
Fire Account.....	-----	595 50	595 50
Cleaning wharves.....	2,192 65	2,778 58	4,971 23
Legal expense.....	114 20	206 00	320 20
Sea-wall Account.....	4,803 38	107,091 87	111,895 25
Profit and Loss—raising schooner Santa Rosa, and repairing bark Amethyst.....	1,665 88	-----	1,665 88
Office appropriation.....	55 50	498 97	554 47
Wharf offices and furniture.....	555 27	804 27	1,359 54
Harbor-master's Expense Account.....	138 00	141 25	279 25
Overpaid dockage returned.....	36 40	29 50	65 90
Overpaid tolls returned.....	67 75	-----	67 75
Gas used at Washington Street wharf.....	39 90	37 25	77 15
Moving vessels.....	65 00	-----	65 00
Rent of wharf offices.....	160 00	140 00	300 00
San Francisco Harbor Improvement Fund: Amount remitted.....	285,521 50	274,370 87	559,892 37
	\$609,229 62	\$708,184 94	\$1,317,414 56

TABLE B.

Statement of the Amount Paid on Account of Construction for the two fiscal years ending June 30, 1879.

Date.	To Whom Paid.	On Account of.	Amount.	Total.
July 6, 1877	Sweet & Fulton	Reconstructing Battery Street wharf	\$4,307 13	-----
July 6, 1877	Talbot & Onderdonk	Ferry slips—on account	8,000 00	-----
July 7, 1877	Daily Alta	Advertising for construction	11 50	-----
July 7, 1877	M. W. Bell	Services supervising construction	30 00	-----
July 16, 1877	W. L. Richardson	Reconstructing wharves	500 00	-----
July 21, 1877	Talbot & Onderdonk	Ferry slips, in full of contract price	22,758 00	-----
July 25, 1877	J. W. Donohue	Services supervising construction	72 00	-----
July 26, 1877	M. E. Bassett	Services supervising construction	39 00	-----
July 31, 1877	W. L. Richardson	Reconstructing wharves, per contract	1,348 70	-----
August 16, 1877	Sheldon & Graves	Removing old Pacific Street wharf—on account	1,500 00	-----
August 17, 1878	N. P. Yerine	Covering East Street with asphaltum	930 84	-----
August 25, 1877	J. W. Donohue	Services supervising construction	54 00	-----
August 28, 1877	M. E. Bassett	Reconstructing old ferry slips	81 00	-----
September 4, 1877	Talbot & Onderdonk	Lumber furnished, as per award	8,947 31	-----
September 4, 1877	Adams & Taylor	Removing old Pacific Street wharf—on account	2,352 80	-----
September 7, 1877	Sheldon & Graves	Sheds over aprons at ferry slips—on account	737 00	-----
September 7, 1877	M. Miles & Co.	Services supervising construction	700 00	-----
September 25, 1877	J. W. Donohue	Sheds over aprons at ferry slips—in full	15 00	-----
September 25, 1877	M. E. Bassett	Services supervising construction	30 00	-----
September 28, 1877	M. Miles & Co.	Sheds over aprons at ferry slips—in full	794 00	-----
September 28, 1877	Adams & Taylor	Lumber, furnished as per award	1,277 03	-----
October 1, 1877	Smith & Smith	Covering East Street with asphaltum	594 45	-----
October 27, 1877	Adams & Taylor	Lumber furnished, as per award	1,202 44	-----
November 17, 1877	Smith & Smith	Covering East Street with asphaltum	343 98	-----
November 26, 1877	J. W. Donohue	Services supervising construction	15 00	-----
November 28, 1877	Adams & Taylor	Lumber furnished, as per award	921 61	-----
January 28, 1878	Adams & Taylor	Lumber furnished, as per award	439 76	-----
February 26, 1878	Adams & Taylor	Lumber furnished, as per award	715 97	-----
February 28, 1878	Sheldon & Graves	Removing old Pacific Street wharf, as per Act approved Feb. 12, 1878	1,209 00	-----
March 29, 1878	Adams & Taylor	Lumber furnished, as per award	1,789 89	-----
March 19, 1878	W. L. Richardson	Driving and pulling piles	1,307 70	-----
April 8, 1878	Daily Alta	Advertising for construction	10 15	-----
April 24, 1878	W. L. Richardson	Driving and pulling piles	1,703 95	-----
April 25, 1878	J. W. Donohue	Services supervising construction	81 00	-----

April 27, 1878.	Adams & Taylor.	Lumber furnished, as per award.	1,990 46	
May 8, 1878.	Adams & Taylor.	Extension of Broadway wharf—on account.	8,000 00	
May 24, 1878.	Adams & Taylor.	Extension of Broadway wharf—on account.	5,000 00	
May 25, 1878.	J. W. Donohue.	Services supervising construction.	72 00	
June 10, 1878.	Adams & Taylor.	Extension of Broadway wharf—in full.	6,395 00	
June 25, 1878.	E. C. Boober.	Driving piles at new Berkeley ferry.	1,026 20	
June 26, 1878.	Renton, Holmes & Co.	Lumber furnished, as per award.	1,276 40	
June 28, 1878.	J. W. Donohue.	Services supervising construction.	69 00	
				\$88,649 57
July 11, 1878.	Renton, Holmes & Co.	Amount paid for the fiscal year ending June 30th, 1878.		
July 11, 1878.	Adams & Taylor.	Shed on Broadway Street wharf.	\$6,295 00	
July 16, 1878.	Daily Alta.	Extra work on Broadway Street wharf.	428 00	
July 25, 1878.	J. W. Donohue.	Advertising for construction.	26 10	
July 26, 1878.	Adams & Taylor.	Services supervising construction.	75 00	
July 27, 1878.	Renton, Holmes & Co.	Extension of Union Street wharf—on account.	10,000 00	
August 8, 1878.	Daily Alta.	Lumber furnished, as per award.	1,802 39	
August 9, 1878.	John A. Fulton.	Advertising for construction.	18 85	
August 19, 1878.	Daily Alta.	Widening Davis Street—on account.	2,000 00	
August 24, 1878.	Renton, Holmes & Co.	Advertising for construction.	11 60	
August 26, 1878.	J. W. Donohue.	Widening Davis Street.	1,102 85	
August 27, 1878.	Winterburn & Co.	Lumber furnished, as per award.	1,187 60	
August 27, 1878.	Adams & Taylor.	Services supervising construction.	78 00	
September 14, 1878.	Norton & Day.	Printing specifications.	30 00	
September 25, 1878.	Daily Alta.	Extension of Union Street wharf.	7,060 00	
September 25, 1878.	Daily Examiner.	Shed at S. P. C. R. R. ferry landing—on account.	1,000 00	
September 25, 1878.	J. W. Donohue.	Advertising for construction.	14 50	
September 26, 1878.	Renton, Holmes & Co.	Advertising for construction.	24 00	
October 8, 1878.	Daily Alta.	Services supervising construction.	63 00	
October 11, 1878.	Norton & Day.	Lumber furnished, as per award.	1,362 65	
October 23, 1878.	Renton, Holmes & Co.	Shed at S. P. C. R. R. ferry landing.	2,970 00	
October 26, 1878.	W. L. Richardson.	Advertising for construction.	26 10	
November 4, 1878.	Daily Examiner.	Extra work, shed S. P. C. R. R. ferry landing.	331 12	
November 19, 1878.	W. L. Richardson.	Lumber furnished, as per award.	1,963 53	
November 26, 1878.	Renton, Holmes & Co.	Services supervising construction.	75 00	
December 9, 1878.	Norton & Day.	Driving piles at Folsom Street wharf.	3,960 00	
December 13, 1878.	Daily Alta.	Advertising for construction.	48 00	
		Fishermen's wharf.	1,100 00	
		Lumber furnished, as per award.	1,336 80	
		Services supervising construction.	78 00	
		Shed on Spear Street wharf.	2,973 40	
		Advertising for construction.	13 05	
				\$47,554 54
				\$88,649 57

Amount carried forward.

TABLE B—Continued.

Date.	To Whom Paid.	On Account of.	Amount.	Total.
December 14, 1878.	E. C. Fitzhugh	Amount brought forward	\$47,554 54	\$88,649 57
December 24, 1878.	Adams & Taylor	Services supervising construction	68 00	
December 24, 1878.	J. W. Donohue	Lumber furnished	1,041 41	
December 27, 1878.	E. C. Boolar	Services supervising construction	75 00	
December 31, 1878.	W. L. Richardson	Furnishing and driving piles	695 00	
January 16, 1879.	F. T. Swift	Wharf at Fifth and Channel, and piles at Harrison and Spear	1,070 00	
January 23, 1879.	E. C. Boolar	Wharf south side of Channel Street	300 00	
January 24, 1879.	Winterburn & Co.	Driving and pulling piles	1,000 00	
January 25, 1879.	Daily Alta	Printing specifications	17 50	
January 30, 1879.	J. W. Donohue	Advertising for construction	37 70	
February 4, 1879.	Daily Examiner	Services supervising construction	66 00	
February 11, 1879.	R. Larrimore, Jr.	Advertising for construction	30 00	
February 13, 1879.	E. C. Boolar	Shed at Saucelito ferry—on account	500 00	
February 13, 1879.	Winterburn & Co.	Driving and pulling piles	1,015 00	
February 13, 1879.	Adams & Taylor	Printing specifications	9 50	
February 21, 1879.	Norton & Day	Dry dock slips—on account	7,000 00	
February 21, 1879.	J. W. Donohue	Sewer foot of Market Street—on account	3,500 00	
February 28, 1879.	Adams & Taylor	Services supervising construction	78 00	
March 3, 1879.	N. P. C. R. R. Company	Dry dock slips—on account	7,000 00	
March 4, 1879.	Daily Alta	Purchase of buildings from N. P. C. R. R. Company	2,000 00	
March 21, 1879.	R. Larrimore, Jr.	Advertising for construction	13 05	
March 25, 1879.	J. W. Donohue	Shed at Saucelito ferry	1,022 00	
March 26, 1879.	Adams & Taylor	Services supervising construction	69 00	
March 26, 1879.	W. L. Richardson	Dry dock slips—on account	12,000 00	
March 28, 1879.	Daily Examiner	Extension of Green Street wharf—on account	1,200 00	
April 10, 1879.	Norton & Day	Advertising for construction	16 00	
April 14, 1879.	W. L. Richardson	Sewer foot of Market Street—on account	2,000 00	
April 14, 1879.	Adams & Taylor	Moving shed from Spear Street wharf	1,050 00	
April 21, 1879.	W. L. Richardson	Dry dock slips	6,997 00	
April 25, 1879.	J. W. Donohue	Extension of Green Street wharf—on account	5,000 00	
May 8, 1879.	W. L. Richardson	Services supervising construction	84 00	
May 8, 1879.	W. G. Fowler	Extension of Green Street wharf—on account	8,000 00	
May 10, 1879.	Winterburn & Co.	Covering piles at Green Street wharf	366 37	
May 12, 1879.	Adams & Taylor	Printing specifications	12 50	
May 15, 1879.	Norton & Day	Extra work on dry dock slips	247 93	
May 26, 1879.	W. L. Richardson	Sewer foot of Market Street	4,311 06	
		Extension of Green Street wharf—on account	6,000 00	

May 26, 1879	J. W. Donohue	Services supervising construction	75 00	
May 27, 1879	Daily Alta	Advertising for construction	11 60	
May 28, 1879	W. L. Richardson	Extension of Green Street wharf—on account	7,294 00	
June 16, 1879	O. F. Graves	Vallejo Street wharf—on account	7,000 00	
June 24, 1879	J. W. Donohue	Services supervising construction	81 00	
June 27, 1879	Adams & Taylor	Lumber furnished	1,070 23	
June 27, 1879	W. L. Richardson	Extension of Green Street wharf	500 00	
		Amount paid for the fiscal year ending June 30th, 1879		\$137,378 39
		Amount paid for the two fiscal years ending June 30th, 1879		\$226,027 96

TABLE C.

Statement of the San Francisco Harbor Improvement Fund for the two fiscal years ending June 30th, 1879.

De.

July 1, 1877-----	To balance on hand in San Francisco Harbor Improvement Fund-----	-----	\$332,309 93
July 18, 1877-----	To amount remitted by Commissioners-----	\$7,000 00	-----
July 28, 1877-----	To amount remitted by Commissioners-----	3,000 00	-----
August 2, 1877-----	To amount remitted by Commissioners-----	10,261 91	-----
	Total amount remitted by Commissioners for July-----		20,261 91
August 15, 1877-----	To amount remitted by Commissioners-----	\$7,000 00	-----
August 28, 1877-----	To amount remitted by Commissioners-----	4,000 00	-----
September 3, 1877-----	To amount remitted by Commissioners-----	12,173 87	-----
	Total amount remitted by Commissioners for August-----		23,173 87
September 13, 1877-----	To amount remitted by Commissioners-----	\$12,000 00	-----
September 20, 1877-----	To amount remitted by Commissioners-----	4,000 00	-----
October 2, 1877-----	To amount remitted by Commissioners-----	16,000 00	-----
October 3, 1877-----	To amount remitted by Commissioners-----	1,181 00	-----
	Total amount remitted by Commissioners for September-----		33,181 00
October 15, 1877-----	To amount remitted by Commissioners-----	\$7,000 00	-----
October 25, 1877-----	To amount remitted by Commissioners-----	8,000 00	-----
November 1, 1877-----	To amount remitted by Commissioners-----	12,000 00	-----
November 3, 1877-----	To amount remitted by Commissioners-----	4,086 20	-----
	Total amount remitted by Commissioners for October-----		31,086 20
November 14, 1877-----	To amount remitted by Commissioners-----	\$9,000 00	-----
November 27, 1877-----	To amount remitted by Commissioners-----	4,000 00	-----
December 3, 1877-----	To amount remitted by Commissioners-----	13,660 91	-----
	Total amount remitted by Commissioners for November-----		26,660 91
December 14, 1877-----	To amount remitted by Commissioners-----	\$7,000 00	-----
December 18, 1877-----	To amount remitted by Commissioners-----	4,000 00	-----
December 29, 1877-----	To amount remitted by Commissioners-----	4,000 00	-----
January 3, 1878-----	To amount remitted by Commissioners-----	11,001 70	-----
	Total amount remitted by Commissioners for December-----		26,001 70

January 14, 1878-----	To amount remitted by Commissioners-----	7,000 00	-----
January 25, 1878-----	To amount remitted by Commissioners-----	6,000 00	-----
February 2, 1878-----	To amount remitted by Commissioners-----	9,902 82	-----
February 13, 1878-----	Total amount remitted by Commissioners for January-----	22,902 92	-----
March 2, 1878-----	To amount remitted by Commissioners-----	\$7,000 00	-----
March 2, 1878-----	To amount remitted by Commissioners-----	14,850 53	-----
March 13, 1878-----	Total amount remitted by Commissioners for February-----	21,850 53	-----
March 26, 1878-----	To amount remitted by Commissioners-----	\$7,000 00	-----
April 2, 1878-----	To amount remitted by Commissioners-----	5,000 00	-----
April 2, 1878-----	To amount remitted by Commissioners-----	9,617 97	-----
May 2, 1878-----	Total amount remitted by Commissioners for March-----	21,617 97	-----
May 2, 1878-----	To amount remitted by Commissioners-----	\$14,751 42	-----
May 20, 1878-----	Total amount remitted by Commissioners for April-----	14,751 42	-----
June 1, 1878-----	To amount remitted by Commissioners-----	\$7,000 00	-----
June 3, 1878-----	To amount remitted by Commissioners-----	4,000 00	-----
June 3, 1878-----	To amount remitted by Commissioners-----	8,773 53	-----
June 13, 1878-----	Total amount remitted by Commissioners for May-----	19,773 53	-----
June 26, 1878-----	To amount remitted by Commissioners-----	\$7,000 00	-----
July 2, 1878-----	To amount remitted by Commissioners-----	7,000 00	-----
July 2, 1878-----	To amount remitted by Commissioners-----	10,259 54	-----
July 19, 1878-----	Total amount remitted by Commissioners for June-----	24,259 54	-----
August 2, 1878-----	To amount remitted by Commissioners-----	\$6,000 00	-----
August 2, 1878-----	To amount remitted by Commissioners-----	16,582 96	-----
August 9, 1878-----	Total amount remitted by Commissioners for July-----	22,582 96	-----
August 15, 1878-----	To amount remitted by Commissioners-----	\$4,960 00	-----
August 20, 1878-----	To amount remitted by Commissioners-----	2,000 00	-----
August 26, 1878-----	To amount remitted by Commissioners-----	6,000 00	-----
August 28, 1878-----	To amount remitted by Commissioners-----	3,000 00	-----
September 3, 1878-----	To amount remitted by Commissioners-----	12,459 94	-----
September 10, 1878-----	Total amount remitted by Commissioners for August-----	28,419 94	-----
September 17, 1878-----	To amount remitted by Commissioners-----	\$4,000 00	-----
September 23, 1878-----	To amount remitted by Commissioners-----	7,000 00	-----
September 23, 1878-----	To amount remitted by Commissioners-----	4,000 00	-----
September 23, 1878-----	Amount carried forward-----	\$15,000 00	-----
		\$608,834 33	-----

TABLE C—Continued.

Dr.

October 3, 1878-----	Amount brought forward-----	\$15,000 00	\$668,834 33
	To amount remitted by Commissioners-----	15,545 20	
October 12, 1878-----	Total amount remitted by Commissioners for September-----		30,545 20
October 17, 1878-----	To amount remitted by Commissioners-----	\$5,000 00	
October 28, 1878-----	To amount remitted by Commissioners-----	4,000 00	
November 2, 1878-----	To amount remitted by Commissioners-----	6,000 00	
November 4, 1878-----	To amount remitted by Commissioners-----	12,500 00	
	To amount remitted by Commissioners-----	1,869 07	
November 14, 1878-----	Total amount remitted by Commissioners for October-----		29,369 07
November 22, 1878-----	To amount remitted by Commissioners-----	\$9,000 00	
December 3, 1878-----	To amount remitted by Commissioners-----	6,000 00	
	To amount remitted by Commissioners-----	12,637 71	
December 14, 1878-----	Total amount remitted by Commissioners for November-----		27,637 71
December 21, 1878-----	To amount remitted by Commissioners-----	\$7,000 00	
January 3, 1879-----	To amount remitted by Commissioners-----	5,000 00	
	To amount remitted by Commissioners-----	14,514 61	
January 13, 1879-----	Total amount remitted by Commissioners for December-----		26,514 61
February 3, 1879-----	To amount remitted by Commissioners-----	\$7,000 00	
	To amount remitted by Commissioners-----	12,532 39	
February 20, 1879-----	Total amount remitted by Commissioners for January-----		19,532 39
March 3, 1879-----	To amount remitted by Commissioners-----	\$6,000 00	
	To amount remitted by Commissioners-----	8,895 31	
March 21, 1879-----	Total amount remitted by Commissioners for February-----		14,895 31
April 2, 1879-----	To amount remitted by Commissioners-----	\$6,000 00	
	To amount remitted by Commissioners-----	12,146 52	
April 14, 1879-----	Total amount remitted by Commissioners for March-----		18,146 52
May 2, 1879-----	To amount remitted by Commissioners-----	\$6,000 00	
	To amount remitted by Commissioners-----	13,958 28	
May 23, 1879-----	Total amount remitted by Commissioners for April-----		19,958 28
	To amount remitted by Commissioners-----	\$7,000 00	

June 3, 1879-----	To amount remitted by Commissioners-----	12,669 90	-----
June 18, 1879-----	Total amount remitted by Commissioners for May-----		19,669 90
July 2, 1879-----	To amount remitted by Commissioners-----	\$5,000 00	-----
	To amount remitted by Commissioners-----	12,098 98	-----
	Total amount remitted by Commissioners for June-----		17,098 98
	Total amount remitted-----		\$892,202 30

TABLE C—Continued.

Cr.

Date.	ORDER.	No.	Contract.	Amount.
July 6, 1877	Sweett & Fulton	62	Reconstructing Battery Street wharf	\$4,307 13
July 6, 1877	Talcott & Onderdonk	63	New ferry slips—on account	8,000 00
July 14, 1877	W. L. Richardson	64	Repairing several wharves	500 00
July 21, 1877	Talcott & Onderdonk	65	New ferry slips	22,758 00
July 31, 1877	W. L. Richardson	66	General repairs	1,348 70
August 16, 1877	Sheldon & Graves	67	Removing old Pacific Street wharf—on account	1,500 00
August 17, 1877	N. P. Perine	68	Covering East Street with asphaltum	930 84
August 30, 1877	Middlemas & Boole	69	Repairing two sewers for dredger	2,061 34
September 4, 1877	Adams & Taylor	70	Lumber furnished, as per award	2,352 80
September 4, 1877	Alexander Hay	71	Hull and water-tank for dredger—on account	1,000 00
September 4, 1877	Talcott & Onderdonk	72	Repairing old ferry slips	8,947 31
September 7, 1877	Sheldon & Graves	73	Removing old Pacific Street wharf	737 00
September 7, 1877	M. Miles & Co.	74	Shed over ferry aprons—on account	700 00
September 14, 1877	Hawkins & Cantrell	75	Machinery for dredger—on account	4,000 00
September 27, 1877	Adams & Taylor	76	Lumber furnished, as per award	1,277 03
September 28, 1877	Alexander Hay	77	Hull and water-tank for dredger—on account	2,000 00
September 28, 1877	M. Miles & Co.	78	Shed over ferry aprons	794 00
October 1, 1877	Smith & Smith	79	Covering bulkhead with asphaltum	594 45
October 18, 1877	Middlemas & Boole	80	Constructing mud-scow, and extras	3,549 20
October 26, 1877	Adams & Taylor	81	Lumber furnished, as per award	1,202 44
November 3, 1877	Alexander Hay	82	Hull and water-tank for dredger—on account	2,000 00
November 7, 1877	Bank of California	83	Machinery for steam-tug—on account	3,000 00
November 9, 1877	Hay & Riley	84	Hull for steam-tug—on account	1,200 00
November 26, 1877	Hawkins & Cantrell	85	Machinery for dredger	8,600 00
November 26, 1877	Alexander Hay	86	Hull and water-tank for dredger	1,745 00
November 28, 1877	Adams & Taylor	87	Lumber furnished, as per award	921 61
December 4, 1877	Hay & Riley	88	Hull for steam-tug—on account	2,000 00
December 5, 1877	Hawkins & Cantrell	89	Extra work, machinery for dredger	1,904 96
December 21, 1877	Bank of California	90	Machinery for steam-tug—on account	4,200 00
January 3, 1878	Hay & Riley	91	Hull for steam-tug—on account	2,000 00
January 28, 1878	Adams & Taylor	92	Lumber furnished, as per award	439 76
February 25, 1878	Adams & Taylor	93	Lumber furnished, as per award	715 97
February 26, 1878	Bank of California	94	Machinery for steam-tug—on account	6,000 00
February 27, 1878	Hay & Riley	95	Hull for steam-tug—on account	3,000 00
February 28, 1878	Sheldon & Graves	96	Extra for removing old Pacific Street wharf, as per Act, approved February 13th, 1878	1,209 00

March 4, 1878.....	Bank of California.....	97	Machinery for steam-tug, including extras.....	2,759 92
March 15, 1878.....	W. L. Richardson.....	98	Driving and pulling piles.....	1,507 70
March 28, 1878.....	Adams & Taylor.....	99	Lumber furnished, as per award.....	1,789 89
April 4, 1878.....	Geo. H. Mendell.....	100	Civil Engineer, as per Act of April 1st, 1878.....	1,000 00
April 9, 1878.....	Moynilhan & Aitken.....	101	Boiler for Dredger No. 1.....	2,814 33
April 10, 1878.....	W. T. Garratt.....	102	Two Hooker fire pumps.....	5,200 00
April 11, 1878.....	Hawkins & Cantrell.....	103	Repairing machinery of Dredger No. 1.....	3,358 05
April 17, 1878.....	Hay & Riley.....	104	Hull for steam-tug.....	1,290 00
April 18, 1878.....	George Davidson.....	105	Civil engineer, as per Act of April 1st, 1878.....	1,000 00
April 22, 1878.....	A. F. Rodgers.....	107	Civil engineer, as per Act of April 1st, 1878.....	1,000 00
April 24, 1878.....	Middlemas & Boole.....	108	Rebuilding hull of Dredger No. 1.....	4,635 42
April 24, 1878.....	W. L. Richardson.....	109	Driving piles.....	1,703 95
April 26, 1878.....	Adams & Taylor.....	110	Lumber furnished, as per award.....	1,990 46
April 30, 1878.....	Deacon & Sturtefield.....	111	Repairing engine of "Anasla".....	2,003 06
May 3, 1878.....	T. P. H. Whitelaw.....	112	Raising schooner "Santa Rosa," sunk in harbor.....	1,000 00
May 8, 1878.....	Adams & Taylor.....	113	Extension of Broadway wharf—on account.....	8,000 00
May 24, 1878.....	Adams & Taylor.....	114	Extension of Broadway wharf—on account.....	5,000 00
June 10, 1878.....	Adams & Taylor.....	115	Extension of Broadway wharf.....	6,395 00
June 17, 1878.....	P. B. Cornwall.....	116	Bark "Amethyst," injured by "Anasla".....	665 88
June 24, 1878.....	Renton, Holmes & Co.....	117	Lumber furnished, as per award.....	1,276 40
June 24, 1878.....	E. C. Boobar.....	118	Driving piles.....	1,026 20
July 11, 1878.....	Renton, Holmes & Co.....	119	Shed on Broadway wharf.....	6,295 00
July 11, 1878.....	Adams & Taylor.....	120	Extra work on Broadway wharf.....	428 00
July 26, 1878.....	Renton, Holmes & Co.....	121	Lumber furnished, as per award.....	1,802 39
July 26, 1878.....	Adams & Taylor.....	122	Extension of Union Street wharf—on account.....	10,000 00
August 9, 1878.....	John A. Fulton.....	123	Widening Davis Street—on account.....	2,000 00
August 19, 1878.....	John A. Fulton.....	124	Widening Davis Street.....	1,102 85
August 22, 1878.....	Renton, Holmes & Co.....	125	Lumber furnished, as per award.....	1,187 60
August 27, 1878.....	Adams & Taylor.....	126	Extension of Union Street wharf.....	7,060 00
September 5, 1878.....	Middlemas & Boole.....	127	Building a mud-scow.....	3,845 00
September 14, 1878.....	Norton & Day.....	128	Sheds at S. P. C. R. R. ferry landing—on account.....	1,000 00
September 26, 1878.....	Renton, Holmes & Co.....	129	Lumber furnish, as per award.....	1,362 65
October 8, 1878.....	Norton & Day.....	130	Sheds at S. P. C. R. R. ferry landing.....	2,970 00
October 22, 1878.....	Renton, Holmes & Co.....	131	Lumber furnished, as per award.....	1,963 53
November 4, 1878.....	W. L. Richardson.....	132	Driving piles at Folsom Street.....	3,960 00
November 19, 1878.....	W. L. Richardson.....	133	Fishermen's wharf.....	1,100 00
November 25, 1878.....	Renton, Holmes & Co.....	134	Lumber furnished, as per award.....	1,336 80
December 3, 1878.....	A. Onderdonk.....	135	Constructing sea-wall.....	1,486 50
December 9, 1878.....	Norton & Day.....	136	Shed on Spear Street wharf.....	2,973 40
December 24, 1878.....	Adams & Taylor.....	137	Lumber furnished.....	1,041 41
December 27, 1878.....	E. C. Boobar.....	138	Driving piles.....	695 00
Amount carried forward.....				\$214,322 83

TABLE C—Continued.

Cr.

Date.	ORDER.	No.	Contract.	Amount.
December 30, 1878.	W. L. Richardson	139	Amount brought forward	\$214,322 83
January 3, 1879.	Bank of California	140	Wharf at Fifth and Channel, and piles at Harrison and Spear	1,070 00
January 3, 1879.	A. Onderdonk	141	Constructing sea-wall	8,335 00
January 16, 1879.	F. P. Swett	142	Constructing sea-wall	2,676 38
January 23, 1879.	E. C. Boobar	143	Wharf south side of Channel Street	300 00
February 5, 1879.	A. Onderdonk	144	Driving and pulling piles	1,000 00
February 5, 1879.	A. Onderdonk	145	Constructing sea-wall	4,500 00
February 5, 1879.	A. Onderdonk	146	Constructing sea-wall	8,640 37
February 11, 1879.	A. Onderdonk	147	Constructing sea-wall	3,640 00
February 12, 1879.	R. Larrimore, Jr.	148	Shed at Saucelito Ferry—on account	500 00
February 12, 1879.	E. C. Boobar	149	Driving fender piles	1,015 00
February 15, 1879.	Adams & Taylor	150	Dry dock slips—on account	7,000 00
February 21, 1879.	Norton & Day	151	Sewer foot of Market Street—on account	3,500 00
February 28, 1879.	Adams & Taylor	152	Dry dock slips—on account	7,000 00
March 1, 1879.	N. P. C. R. R. Company	153	Purchase of buildings	2,000 00
March 3, 1879.	A. Onderdonk	154	Constructing sea-wall	15,240 23
March 3, 1879.	A. Onderdonk	155	Constructing sea-wall	5,000 00
March 21, 1879.	R. Larrimore, Jr.	156	Shed at Saucelito Ferry	1,022 00
March 26, 1879.	Adams & Taylor	157	Dry dock slips—on account	12,000 00
March 26, 1879.	W. L. Richardson	158	Extension of Union Street wharf—on account	1,200 00
April 3, 1879.	A. Onderdonk	159	Constructing sea-wall	7,340 62
April 3, 1879.	A. Onderdonk	160	Constructing sea-wall	4,000 00
April 3, 1879.	A. Onderdonk	161	Constructing sea-wall	779 32
April 10, 1879.	Norton & Day	162	Constructing sea-wall	3,109 00
April 12, 1879.	W. L. Richardson	163	Sewer foot of Market Street—on account	2,000 00
April 14, 1879.	Adams & Taylor	164	Removing shed on Spear Street	1,050 00
April 21, 1879.	W. L. Richardson	165	Dry dock slips	6,997 00
May 2, 1879.	A. Onderdonk	166	Extension of Green Street—on account	5,000 00
May 2, 1879.	A. Onderdonk	167	Constructing sea-wall	6,866 55
May 8, 1879.	W. L. Richardson	168	Constructing sea-wall	8,196 87
May 15, 1879.	Norton & Day	169	Extension of Green Street—on account	4,311 06
May 26, 1879.	W. L. Richardson	170	Sewer foot of Market Street	6,000 00
May 28, 1879.	W. L. Richardson	171	Extension of Green Street—on account	7,294 00
June 4, 1879.	A. Onderdonk	172	Constructing sea-wall	5,143 50
June 4, 1879.	A. Onderdonk	173	Constructing sea-wall	17,857 13

June 16, 1879-----	O. F. Graves-----	174	Vallejo Street wharf—on account-----	7,000 00
June 27, 1879-----	Adams & Taylor-----	175	Lumber furnished-----	1,070 23
June 27, 1879-----	W. L. Richardson-----	176	Extension of Green Street wharf-----	500 00
				\$404,477 19
			Balance in San Francisco Harbor Improvement Fund-----	487,725 11
				\$892,202 30

TABLE D.

Statement of cost of dredging.

Fiscal year ending	Salary of employees.	Repairs.	Coal.	Ship chandlery and water.	Miscellaneous, including docking, dredgers, tugs, and scows.	Total.	Number of yards dredged.	Worked number of hours.	Cost per cubic yard.
June 30, 1875-----	\$11,663 97	\$10,362 99	\$8,639 00	\$1,386 64	\$1,301 25	\$33,835 71	302,429	2,348½	10 76-100
June 30, 1876-----	11,932 98	7,639 43	8,224 04	1,660 85	1,905 74	31,363 19	342,638	2,634	9 15-100
June 30, 1877-----	11,980 99	4,041 44	5,971 71	1,582 10	1,076 79	25,253 03	280,197	2,478½	9 1-100
June 30, 1878-----	17,188 80	7,372 48	7,754 86	2,666 37	3,032 55	38,214 40	423,654	3,080	9 2-100
June 30, 1879-----	26,201 70	14,963 90	11,755 12	5,443 70	1,289 60	60,454 68	843,879	4,694	7 16-100

TABLE E.
Comparative statement of receipts and disbursements.

Fiscal year—From the organization of the Commission	Receipts—From dockage, tolls, wharfage, rents, etc.	Expenses—Salaries Commissioners, Secretary, Engineer, Clerk, (and law fees), Wharfingers, Collectors, fuel, rent, printing, stationery.	Percentage—Per year	Construction and repairs—Building wharves, bulkheads, sheds etc., and repairs on the same	Sea-wall	Dredging—All dredging up to 1874 was done under contract; since, by Commissioners	Purchase of dredger, scows, and repairs	Miscellaneous	Remitted State Treasurer	Drawn from State Treasurer
1863-4	\$117,848 28	\$25,354 84	21.50	\$67,599 82				\$676 25	\$71,897 39	\$47,680 02
1864-5	177,393 66	32,439 10	18.28	80,575 15					123,365 23	62,334 82
1865-6	182,716 80	35,531 42	19.42	19,065 42	\$3,607 00	\$44,106 50			132,023 96	47,568 50
1866-7	336,409 36	41,233 95	11.95	88,525 78	266 50	10,300 00		330 62	268,573 45	64,345 94
1867-8	294,304 28	55,531 92	18.87	82,791 27	250,991 97	41,021 00		561 18	217,528 06	354,121 12
1868-9	287,890 53	52,130 77	18.11	38,779 83	262,323 13	32,338 00			212,532 07	310,213 27
1869-70	252,649 56	54,684 40	21.65	35,545 04	165,892 68	80,100 00			180,623 37	272,670 93
1870-1	148,917 03	37,782 65	25.37	53,693 31		35,258 00			96,097 20	75,914 13
1871-2	195,031 14	61,006 70	31.28	28,146 62		53,944 40			105,877 82	53,944 40
1872-3	190,330 47	69,858 63	36.50	78,776 28		32,293 20			91,042 59	80,640 23
1873-4	263,709 06	77,938 05	29.33	104,175 98	2,321 85	42,478 56	\$34,070 00	6,344 01	166,150 23	168,769 62
1874-5	373,541 72	68,617 14	18.37	203,540 80	1,078 25	33,835 71	3,725 00	924 99	245,369 00	189,549 17
1875-6	372,078 74	65,976 57	17.73	162,000 25		40,802 70		565 47	249,450 44	146,716 69
1876-7	448,087 25	79,208 85	17.68	284,023 05		25,252 94	15,354 45		310,909 33	266,661 37
1877-8	446,516 82	84,326 72	18.88	112,628 95	4,803 38	38,214 40	82,068 79	1,665 88	285,521 50	162,712 80
1878-9	466,420 55	97,162 63	20.83	164,560 55	107,091 87	60,454 68	3,948 84	595 50	274,370 87	241,764 39
	\$4,556,845 25	\$938,784 34		\$1,610,728 10	\$798,376 63	\$570,400 09	\$139,167 08	\$11,663 90	\$3,031,332 51	\$2,543,607 40
Balance in the treasury										487,725 11
										\$2,031,332 51

NOTE.—May 1st, 1872—Rates of dockage, tolls, wharfage and rents were reduced 50 per cent. by Act of Legislature. Salaries of wharfingers and collectors were increased 25 per cent. by Act of Legislature, approved 19th March, 1878.

BALANCE SHEET—FROM NOVEMBER 4TH, 1863, TO JUNE 30TH, 1879.

RECEIPTS.

From dockage, tolls, wharfage, and rents, etc.-----	\$4,556,845 25
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DISBURSEMENTS.

Salaries of Commissioners, Secretary, Engineer, Attorney, law fees, Wharfingers, Collectors, fuel, rent, printing, and stationery _	\$938,784 34	
Construction of wharves, bulkheads, sheds, etc.-----	1,610,728 10	
Sea-wall, construction of-----	798,376 63	
Dredging, cost of-----	570,400 09	
Purchase of, and constructing dredgers, steam tugs, and scows---	139,167 08	
Miscellaneous, loss of coal, wheat, iron, etc. by falling off wharves _	11,663 90	
Cash on hand in treasury -----	487,725 11	
	<hr/>	\$4,556,845 25

CASH.

Dr.

Amount remitted to the State Treasurer-----	\$3,031,332 51
---	----------------

Cr.

By amount drawn from State Treasurer-----	\$2,543,607 40	
Cash on hand in the treasury -----	487,725 11	
	<hr/>	\$3,031,332 51

REPORT OF J. B. LAMAR, ATTORNEY OF THE BOARD OF STATE HARBOR COMMISSIONERS.

To the Honorable Board of State Harbor Commissioners:

I herewith submit a statement, showing what has transpired in relation to the business in my charge, as your attorney, since my former report under date of October 1st, 1877.

Cases pending on the first day of October, 1877—their objects and disposition:

Soule et al., Board of State Harbor Commissioners, vs. B. Holiday, Jr.
—*Nineteenth District Court.*

This is an action for \$395 87, dockage, and is still undisposed of.

Soule et al., Board of State Harbor Commissioners, vs. Pope and Talbot
—*Nineteenth District Court.*

Same vs. Same—Nineteenth District Court.

The last two above cases are for the aggregate sum of \$1,396 50—tolls claimed as due the State for lumber landing at Second and Berry Street wharf. The defendants built the wharf in 1861, and have ever since had possession of it. Upon these facts, they claim that the Board of State Harbor Commissioners has no jurisdiction to collect dockage, wharfage, and tolls at said wharf. In these cases, judgment was rendered for defendants in the Court below, and appeals are now pending in the Supreme Court.

Soule et al., Board of State Harbor Commissioners, vs. The San Francisco Gas Light Company—Nineteenth District Court.

Same vs. Same—Nineteenth District Court.

These actions are to recover \$2,259 36—tolls for coal landed at Second and Berry Street wharf. The issues are the same in both—that is, whether the toll legally chargeable is 10 or 6½ cents per ton. The plaintiffs had judgment for 6½ cents per ton, and both parties appealed to the Supreme Court.

The cases have been argued and submitted, but no decision has been yet rendered.

Pacific Transfer Company vs. The Board of State Harbor Commissioners
—*Twelfth District Court.*

This was an action brought to recover of the Board of State Harbor Commissioners \$200, wharfage alleged to have been illegally collected of the plaintiffs. Defendants had judgment in the Court below, and

on plaintiffs' appeal to the Supreme Court the judgment was reversed, and the cause remanded, with directions to the District Court to overrule the demurrer to the complaint. There has been on further action taken, and I suppose the case is ended.

The People vs. The San Francisco Gas Light Company—Nineteenth District Court.

This action is to recover \$334 40 tolls for coal landed at Potrero wharf. Defendants built the wharf in 1873, and have ever since had possession, and deny plaintiff's right to dockage, wharfage, and tolls. The District Court gave judgment for defendants, and plaintiffs appealed to the Supreme Court. This case has been argued and submitted, but is undecided.

The People vs. the Union Lumber Association—Fifteenth District Court.

This is an agreed case to determine as the ultimate question the monthly rental due from defendants to plaintiffs for the lease of the wharf at the foot of Beale Street. Plaintiffs claiming \$800 per month; defendants admitting their right to \$400 per month, and resisting the balance. Defendants had judgment in the District Court, which judgment was affirmed in the Supreme Court.

The People vs. Pope and Talbot—Nineteenth District Court.

Action for \$2,793 11. The issues in the case are the same, and the judgment the same as in the other cases of the same title hereinbefore mentioned.

The People vs. The Southern Pacific Railroad Company—Nineteenth District Court.

Action for dockage, wharfage, and tolls. Defendants had judgment in the Court below—affirmed in the Supreme Court.

The People vs. Hooper, et al.—Nineteenth District Court.

Action for dockage of vessels occupying berths in Channel Street, opposite Block 43. Judgment for defendants in the Court below; affirmed in the Supreme Court.

The last two cases, and also the People against Union Lumber Association, were elaborately argued in the Supreme Court, but no opinion was expressed in the decision of either case. Petitions for rehearing were presented in each case and were severally denied.

The People vs. Turner, Kennedy and Shaw—Twelfth District Court.

This case was brought in Justice Court and transferred. It is still pending in the District Court. This action was for \$150 wharfage at Channel Street wharf.

The People vs. H. F. Williams—Nineteenth District Court.

This is an agreed case, to determine the right of the Board to collect dockage, wharfage, and tolls in Channel Street, on the south side of Block 17. The case was argued and submitted October 12th, 1877. The Court still has it under advisement.

ACTIONS COMMENCED SINCE OCTOBER FIRST, EIGHTEEN HUNDRED AND SEVENTY-SEVEN—THEIR OBJECTS AND DISPOSITIONS.

The People vs. The San Francisco Gas Light Company—Nineteenth District Court.

Agreed case for \$34 dockage. The object is to test the right of the respective parties to dockage at Second and Berry Street wharf. Defendants had judgment in the District Court, and plaintiffs appealed. The case has been argued and submitted in the Supreme Court.

The People vs. McKinley, et al.—Twelfth District Court.

Action to remove an obstruction from Third Street. The obstruction being voluntarily removed the action was discontinued.

The People vs. the Board of Supervisors of the City and County of San Francisco—Nineteenth District Court

Petition for writ of prohibition.

This was a proceeding to prevent the Board of Supervisors from leasing China Basin. Before the matter was finally determined in Court, the Legislature passed an Act, under the provisions of which the controversy between the Board of State Harbor Commissioners and the Board of Supervisors of the City and County of San Francisco, involving jurisdiction over China Basin, was definitely settled by placing the Basin under the exclusive control of the Harbor Commissioners.

The People vs. The San Francisco Gas Light Company—Twelfth District Court.

Agreed case for \$324 50, dockage at Pretrero gas-works. Plaintiffs had judgment in the District Court and defendants appealed. This case, with all others of the same title, was argued and submitted on the 17th of September, 1879.

The People vs. The Pacific Rolling Mill Company—Nineteenth District Court.

Agreed case for \$220, tolls on coal and iron landed at defendant's wharf.

The case was argued and submitted on the 3d day of May, 1878, and the Court still has it under advisement.

The People vs. Huson et al.—Fourth District Court.

Action on official bond of Wharfinger to recover \$1,045 10, moneys collected and not paid over. Defendants had judgment and an appeal is being taken to the Supreme Court.

The People vs. Caulkins et al.—Fourth District Court.

Action on official bond for \$1,343 16, moneys collected by Wharfinger and not paid over. Judgment by default for the amount sued for, with interest.

The People vs. The Barkentine Victor—United States District Court.

Libel of vessel for dockage in China Basin. Still pending.

Talcott and Onderdonk vs. The Board of State Harbor Commissioners—Nineteenth District Court.

Agreed case, in which plaintiffs seek to compel the Board of State Harbor Commissioners to pay out to plaintiffs \$5,722 50, claimed to be due for extra work on Market Street wharf; and authorized by special Act of the Legislature. The District Court gave judgment for the plaintiffs.

Defendants appealed to the Supreme Court, and the judgment was reversed.

The Board of State Harbor Commissioners vs. Smith and Smith et al.—Fourth District Court.

Action on bond to recover of defendants \$1,000, penalty for breach of contract in not keeping asphaltum covering of a portion of East Street in repair. Case still pending.

Talcott and Onderdonk vs. The Board of State Harbor Commissioners and J. A. McClelland, Secretary.

Petition for writ of mandamus to compel the payment of money claimed in former action by the same plaintiffs. The Court rendered judgment for defendants. The plaintiffs have appealed to the Supreme Court.

Floyd et al., vs. Blanding et al., Commissioners—Fourth District Court.

This is an action to restrain the construction of a portion of the sea-wall being built by Andrew Onderdonk, under a contract with the Board of State Harbor Commissioners. The injunction was granted on the 24th of April last, and an appeal on behalf of defendants was promptly taken. On June 4th the oral argument before the Supreme Court was concluded, and the case taken under advisement. The case is not yet determined.

Pacific Transfer Company vs. The Board of State Harbor Commissioners—Twelfth District Court.

This is an action to recover of the Board \$1,000, moneys alleged to have been illegally collected as wharfage by defendants from plaintiffs. On the 15th of August last defendants had judgment on demurrer.

Hooper et al., vs. Swett—Nineteenth District Court.

On the 28th of December last the plaintiffs obtained an injunction against the defendant. Defendant had contracted with the Board of State Harbor Commissioners to construct a wharf along the south line of Channel Street, between Kentucky and Fourth Streets. Plaintiff is lessee of the Central Pacific Railroad Company.

On the 21st day of July, defendant's motion to dissolve the injunc-

tion was argued and taken under advisement by the Court. There has been no decision upon the motion.

Several cases of minor importance have been brought in the Justice Courts, but have all been settled except one, viz., People vs. Quint et al., which is an action against the sureties on an official bond of a deceased Wharfinger for moneys collected (\$212 87) and not paid over.

Respectfully,

J. B. LAMAR,
Attorney for the Board of State Harbor Commissioners.



BIENNIAL REPORT

OF THE

STATE BOARD OF EQUALIZATION

FOR

THE YEARS 1878 AND 1879.



REPORT.

OFFICE OF THE STATE BOARD OF EQUALIZATION, }
SACRAMENTO, October 1st, 1879. }

To His Excellency, William Irwin, Governor of California:

The State Board of Equalization herewith submit to your Excellency the following report:

The statements particularly required by the Political Code to be reported are contained in the several schedules hereto annexed.

Schedule A shows the number of acres of land assessed in each county, exclusive of city and town lots, and the average value per acre, exclusive of improvements thereon, in the years 1878 and 1879.

Schedule B shows the aggregate value of all city and town lots in the several counties in the year 1878.

Schedule B-2 shows the same in the year 1879.

Schedule C shows the total value of all real estate and total value of all personal property, and the total value of both, in the several counties, in the year 1878.

Schedule C-2 shows the same in the year 1879.

Schedule D shows the kinds of personal property, and the assessed value of each kind, in the several counties, in the year 1878.

Schedule D-2 shows the same in the year 1879.

Schedule E is a summary of the reports of the Auditors of the several counties, after equalization by the County Boards of Equalization, showing the number of acres, value thereof, value of improvements, value of personal property exclusive of money, the amount of money, and the total value of all property, for the year 1878.

Schedule E-2 is the same for the year 1879.

RATE OF STATE TAX.

The State tax for the year 1878 was 55 cents on each \$100 valuation. The amount to be raised was:

For the General Fund.....	\$1,320,000 00
For the School Fund.....	1,200,000 00
For the Interest and Sinking Fund.....	315,000 00
Total.....	\$2,835,000 00

The value of all property in the State was \$584,583,651.

The State tax for the year 1879 is 62½ cents on each \$100 valuation. The amount to be raised is:

For the General Fund.....	\$1,450,000 00
For the School Fund.....	1,250,000 00
For the Interest and Sinking Fund.....	315,000 00
Total.....	\$3,015,000 00

The assessed value of all property in the State in the year 1879, is \$547,622,769, showing a decrease in value, as compared with the previous year, of \$36,960,882. The amount to be raised being \$180,000 greater, and the depreciation in values being nearly \$37,000,000 has caused the increase in the rate of taxation from 55 cents in 1878, to 62½ cents in 1879.

THE RULE FOR ASSESSING PROPERTY.

The law has always required property to be assessed at its full cash value. Prior to 1872, however, Assessors paid apparently but little attention to this requirement. In that year the revenue law of the Code went into operation. The rule which it provided, for the assessment of property, did not differ, at all, from the one which had previously existed. It required all property to be assessed at its full cash value, precisely as the law had previously done. The main point in which the revenue law of the Code differed from the one which it superseded, was that it established a State Board of Equalization, armed with the power to compel the observance of the law in the assessment of property. The powers which the Code conferred on the State Board of Equalization to compel a compliance with the law by County Assessors and County Boards of Equalization in making and equalizing assessments—or rather, which it attempted to confer on the Board, for the Supreme Court has held the exercise of such powers by the Board to be unconstitutional—were exercised without challenge, or at least without hindrance, during the revenue years of 1872 and 1873.

The assessment roll of 1872, as compared with that of the previous year, shows how great the power of the State Board of Equalization was in inducing or compelling the local officers—County Assessors and County Boards of Equalization—to obey the law, in the discharge of their official duties. This example will serve to illustrate, also, how necessary it is to have some central authority, clothed with the necessary power, not merely to secure assessments, according to the rule provided in the law, but to secure uniform valuations of property in the several counties of the State, so that the people of all the counties shall contribute to the support of the State Government the same percentage on the value of their property. A comparison of the assessment roll of 1872—the first assessment made under the supervision of the State Board of Equalization—with that of 1871, will show not alone that in making the latter, Assessors, generally throughout the State, made their assessments in utter obliviousness of the rule for assessing provided in the law, but that in some counties Assessors showed a much greater disregard of, or if we may be permitted to say it, a much greater contempt for the law than in others. Thus, while no Assessor of any county apparently paid, or even pretended to pay, the least attention to the rule which required all property to be assessed at its cash value, the Assessors in some counties managed to miss the rule more widely than did the Assessors in other counties. In some counties property was assessed at perhaps 50 per cent. of its cash value; in others at perhaps 40 per cent.; and still in others at not more than 30 per cent.; and in some even at perhaps not over 20 per cent.

Now it may not be a matter of much practical importance whether the full cash value of property be adopted as the basis or rule of

assessments, or 50, or 30, or 25, or any other percentage of such full cash value. The assessment roll will vary according to the percentage of the full cash value of property which may be taken as the basis of assessments. If the full cash value of property be taken as the basis of assessments, the assessment roll will be twice as great as the roll in an assessment on the basis of 50 per cent., and four times as great as the roll in one on the basis of 25 per cent. of full cash values. And to raise a given amount of revenue the *rate* of taxation must vary *inversely* with the variations of the assessment roll. For example: the rate of taxation, which must be levied to produce a given sum, will be twice as great in the case of assessments on the basis of 50 per cent., or four times as great in the case of assessments on the basis of 25 per cent. of the cash value of property, as in the case of assessments on the basis of the full cash value of property.

There may be something said both for and against the policy of assessments on the basis of the full cash value of property. Such assessments give a large assessment roll, and a correspondingly low *rate* of taxation. This, it is argued, however, leads to extravagance and prodigality in expenditures. It is urged, that in practice, the *rate* of taxation is never diminished in the ratio in which the assessment roll is increased; that, in fact, an increase in the assessment roll only enables the taxing body to collect larger revenues from the people than they would bear, if it were not done without an increase of the *rate*, and consequently without any apparent increase of *taxation*. A small assessment roll, it is suggested, conduces to care and economy in expenditures, by keeping before the taxing body the terrors of an excessive *rate* of taxation. There is, no doubt, something in this view of the case.

On the other hand, it may be urged that to assess property according to a rule which will produce only a meagre assessment roll, and consequently make necessary a high *rate* of taxation, must be to adopt a policy which will neither invite immigration nor capital to the State. A high rate of taxation must tend to discourage both those who would otherwise be disposed to settle in the State, and those who would invest capital therein for the development of its resources. And the converse is also true, a light rate of taxation must tend to cause an influx of both population and capital. But whatever view may be taken—whether it be held to be the wiser policy to assess property at its full cash value, or at 50, or 25, or any other per cent. of such full cash value—there can be no question that the same rule should be observed and enforced in all parts of the State. Otherwise some portions of the people will bear more and other portions less than their just share of the public burdens.

INEQUALITY OF ASSESSMENTS.

We have already stated that a comparison of the assessment roll of 1872—the first year in which the State Board of Equalization, established by the Code, supervised the assessments—with the roll of 1871 will suffice to illustrate how powerful and effective a central board, armed with proper powers, may be in inducing or compelling local Assessors and local Boards of Equalization to observe the law in the discharge of their official duties. As has already been stated, the *rule* for assessing property was the same before as after the adoption of the Code. The law before, as well as after the adoption of the

Code, made it the duty of Assessors to assess property at its full cash value. This rule was the law in 1871 as well as in 1872.

The assessment roll was: In 1871, \$268,709,138; in 1872, \$636,378,114. In both those years mortgages, solvent debts, etc., were assessed.

It will be observed that the assessment roll was increased nearly 200 per cent. in a single year, the rule for assessing being the same in both years. But an examination of the rolls of the several counties for the two years discloses still more remarkable results. For example:

The assessment in San Mateo County was, in 1871, \$1,996,311; in 1872, \$10,535,447; the roll in 1872 being more than five times that of 1871.

The assessment in Tuolumne County was, in 1871, \$1,183,542; in 1872, \$1,457,175.

In El Dorado County it was, in 1871, \$2,168,523; in 1872, \$2,431,757.

And in other mountain counties the increase of the roll in 1872 over that of 1871 was about in the same proportion.

These examples serve to illustrate how necessary it is that there should be some central authority, vested with proper powers, to supervise the local Assessors and local Boards of Equalization, and to compel them to observe the law in the discharge of their official duties.

ASSESSMENTS FROM AND INCLUDING THE YEAR 1872.

It may prove both interesting and instructive if we group some statements made up from the County Auditors' reports to the State Board of Equalization, commencing with the year 1872 and ending with the year 1879. The Auditors' reports are made up from the assessments made by the County Assessors of the several counties, after such assessments have been equalized by the County Boards of Equalization.

The number of acres of land assessed was:

In 1872	20,069,071
In 1873	20,959,908
In 1874	22,109,503
In 1875	23,424,778
In 1876	24,015,868
In 1877	24,812,560
In 1878	24,630,000
In 1879	24,534,057

An inspection of these figures will show:

First—That there was, from 1872 to 1877, an annual increase in the amount of land assessed of nearly 1,000,000 acres.

Second—That since 1877 there has been a decrease of nearly 300,000 acres in the land assessed.

How is this latter fact to be accounted for? Is there that much less land in private ownership now than in 1877? The Assessors' returns indicate such to be the fact. Have the owners of that amount of land relinquished their title to, or abandoned their possession of, it to escape the payment of taxes on it? Or has this amount disappeared from the assessment roll of the State through the dereliction of Assessors?

The Legislature, at its coming session, should clothe the State Board of Equalization, created by the new Constitution, with power to inquire into the cause of this falling off in the amount of land

assessed the last two years, as compared with the amount assessed in 1877, and, if it shall be found to have been caused by the failure of Assessors to discharge their duty, to prevent such derelictions on the part of these officers in the future.

The assessed value of real estate was :

In 1872	-----	\$328,671,559 00
In 1873	-----	315,015,863 00
In 1874	-----	309,049,066 00
In 1875	-----	321,476,557 00
In 1876	-----	347,322,908 00
In 1877	-----	345,226,266 00
In 1878	-----	352,212,158 00
In 1879	-----	329,213,192 00

The assessed value of improvements on real estate was :

In 1872	-----	\$94,300,453 00
In 1873	-----	94,070,373 00
In 1874	-----	91,161,801 00
In 1875	-----	98,442,454 00
In 1876	-----	107,660,243 00
In 1877	-----	113,707,449 00
In 1878	-----	114,814,394 00
In 1879	-----	107,344,299 00

The assessed value of personal property, other than money, and exclusive of mortgages, solvent debts, etc., was :

In 1872	-----	\$71,384,299 00
In 1873	-----	107,552,018 00
In 1874	-----	95,862,451 00
In 1875	-----	86,377,602 00
In 1876	-----	122,762,866 00
In 1877	-----	114,642,786 00
In 1878	-----	106,175,102 00
In 1879	-----	101,198,292 00

The amount of money assessed was :

In 1872	-----	\$14,750,482 00
In 1873	-----	10,565,728 00
In 1874	-----	11,147,312 00
In 1875	-----	15,011,777 00
In 1876	-----	16,484,604 00
In 1877	-----	13,403,606 00
In 1878	-----	11,381,997 00
In 1879	-----	9,866,986 00

The total assessed value of property, exclusive of mortgages, solvent debts, etc., was :

In 1872	-----	\$542,170,889 00
In 1873	-----	527,203,982 00
In 1874	-----	511,717,069 00
In 1875	-----	521,308,330 00
In 1876	-----	594,230,621 00
In 1877	-----	586,980,107 00
In 1878	-----	584,583,651 00
In 1879	-----	547,622,769 00

DEDUCTIONS FROM THE ABOVE TABLES.

An inspection of these tables shows that real estate constitutes about 60 per cent. of our taxable property ; improvements on real estate from 17 to 19 per cent. ; personal property, other than money, from 16 to 20 per cent., and money from 1.8 per cent. to 2.7 per cent.

A further inspection shows that the total assessed value of property this year is 6.3 per cent. less than that of 1878; that the assessed value of real estate is 6.5 per cent. less; that the assessed value of improvements on real estate is 6.5 per cent. less; that the assessed value of personal property, other than money, is 4.6 per cent. less; and that the money assessed is 13 per cent. less.

DEDUCTIONS FROM THE ASSESSMENT ROLLS OF 1878 AND 1879.

An examination of Schedules E and E-2 of this report—said schedules embrace the reports of the Auditors of the several counties to this Board for the years 1878 and 1879, and show the assessed value of the several classes of property, and the total assessed value of all property in each county for those years—shows that this falling off in the aggregate value of all classes of property was not the result of a uniform falling off of values in all the counties. On the contrary it will be observed that in seventeen counties, to wit: in Alameda, Amador, Colusa, Contra Costa, El Dorado, Mariposa, Merced, Modoc, Mono, Sacramento, San Bernardino, San Joaquin, Shasta, Siskiyou, Tehama, Trinity, and Tuolumne, respectively, the total assessed value of property is greater the present year than it was in 1878, while in many others the percentage of decrease is much greater than such percentage in the whole State, as shown above.

As for example: the total assessed value of property in Kern County, the present year, is 37 per cent. less than it was in 1878; the assessed value of real estate is 38 per cent. less; of improvements on real estate 9 per cent.; of personal property, other than real estate, 42 per cent.

In Santa Barbara County the assessed value of real estate is 36 per cent. less this year than it was in 1878; of improvements on real estate, 21 per cent.; of personal property, other than money, 11 per cent.; of all property in the county, 30 per cent.

In Santa Clara County the assessed value of real estate is nearly 13 per cent. less this year than it was last, and of all property in the county nearly 11 per cent.

In San Francisco the assessed value of real estate this year is nearly 12 per cent. less than it was last; the assessed value of improvements on real estate is over 13 per cent. less; of personal property, other than money, .03 per cent.; of money, 19 per cent.; of all property, over 11 per cent.

CONCLUSION.

This Board has no control nor supervision over either County Assessors or County Boards of Equalization. Nor has it any means of informing itself as to the manner in which these local officers and boards discharge their respective duties. It does not know to what extent, or whether at all, Assessors observe, or attempt to observe, that provision of the law which requires them to assess all property in their respective jurisdictions at its full cash value. Nor, if they do not observe this rule, as the Board suspects to be the case with most if not all of the Assessors, does it know what rule they have substituted for it. The Board does not know, if they have discarded the rule prescribed in the law, whether they assess property at 75, or 60, or 50, or some other arbitrary or accidental per cent. of its full

cash value. No more can it tell whether the Assessors of any two counties have adopted the same percentage of the value of property in their respective assessments.

As already pointed out, there is a heavy falling off in the assessment roll this year as compared with that of the previous year. It has been pointed out also that while there has been a heavy depreciation in the value of property in some counties, as shown by the Assessors' books, there has been an increase in the amount, or appreciation in the value, of property in other counties. Now to what extent these results, so varied in their character, are due to actual depreciations and appreciations in the values of property, and to what extent, if at all, to the eccentricities and aberrations of Assessors, the Board has no means of determining and will not undertake to conjecture. It is certain, however, that with separate Assessors for the several counties, and each Assessor acting independently of every other one, with no central authority to supervise and control them, we are constantly taking the risk of having as many standards of valuation as there are counties in the State. And from such assessments all the manifold evils of unequal taxation will necessarily flow.

It has been a misfortune to the State that under the old Constitution we have not been able to vest a State Board of Equalization with the powers that would enable it to enforce uniform assessments of property in the several counties. The provision in the old Constitution which inhibited the Legislature from conferring on a State Board of Equalization the power to equalize assessments is omitted from the new one. In fact the new Constitution itself establishes a State Board of Equalization, and now it only remains with the Legislature to clothe that Board with such powers as will enable it to enforce the equal and impartial assessment of property throughout the State.

Mr. F. R. Hogeboom has acted as Secretary of the Board since the month of January, 1876, rendering most efficient services in that capacity without receiving any remuneration therefor, and we deem it but an act of simple justice to him to call the attention of the Legislature to the propriety of making such an appropriation in his behalf as will be a reasonable compensation for the labor performed.

Respectfully submitted.

W. B. C. BROWN, Controller,
JO HAMILTON, Attorney-General.

F. R. HOGBOOM, Secretary.



STATISTICAL STATEMENTS.



SCHEDULE A.

Showing the number of acres of land assessed in each county, exclusive of city and town lots, and the average value per acre, exclusive of improvements thereon, in 1878 and 1879, from the Assessors' reports.

COUNTIES.	Number of acres of land, 1878.	Average value per acre.	Number of acres of land, 1879.	Average value per acre.
Alameda	417,183	\$30 66	406,568	\$33 42
Alpine	33,341	4 06	38,502	1 25
Amador	139,942	2 26	149,475	2 00
Butte	480,869	11 73	524,903	12 44
Calaveras	230,062	2 27	255,012	3 00
Colusa	1,047,531	8 93	1,057,887	9 18
Contra Costa	431,825	11 28	448,866	11 35
Del Norte	50,807	3 97	50,848	3 87
El Dorado	226,644	6 95	173,504	4 84
Fresno	1,621,385	2 09	1,585,178	2 21
Humboldt	732,398	3 03	750,587	2 90
Inyo	63,584	2 99	62,260	3 75
Kern	1,319,807	2 21	1,515,234	1 51
Lake	146,044	6 08	147,778	6 25
Lassen	132,584	2 60	155,829	2 33
Los Angeles	1,250,884	5 04	1,235,181	5 19
Marin	320,776	15 70	319,099	14 30
Mariposa	191,595	1 69	193,832	1 65
Mendocino	746,583	3 55	747,557	3 54
Merced	989,311	3 55	1,015,805	3 51
Modoc	157,501	3 55	160,873	2 20
Mono	53,187	5 89	66,773	7 57
Monterey	769,467	1 44	762,963	6 10
Napa	338,169	11 76	338,024	11 51
Nevada	220,215	3 50	192,537	2 45
Placer	306,775	2 89	319,878	3 10
Plumas	189,085	5 34	185,717	4 66
Sacramento	616,325	7 88	610,466	7 75
San Benito	310,694	8 50	311,468	8 00
San Bernardino	441,543	3 54	460,900	4 00
San Diego	894,305	1 17	922,199	1 00
San Francisco	6,853	221 55	6,840	171 00
San Joaquin	865,074	11 26	874,091	12 25
San Luis Obispo	921,843	2 68	998,374	2 23
San Mateo	290,659	14 91	296,050	14 42
Santa Barbara	913,415	2 96	858,063	3 17
Santa Clara	541,692	23 33	549,972	21 55
Santa Cruz	233,004	14 40	237,007	12 62
Shasta	123,583	3 39	131,316	3 30
Sierra	86,259	2 99	84,259	3 00
Siskiyou	217,865	3 41	188,770	3 66
Solano	494,601	10 87	495,081	10 62
Sonoma	749,275	10 33	724,412	10 00
Stanislaus	771,039	5 54	758,476	5 16
Sutter	372,076	7 18	372,276	7 34
Tehama	501,242	3 72	850,005	2 71
Trinity	63,962	2 27	73,880	2 14
Tulare	1,162,074	2 52	1,117,040	2 30
Tuolumne	172,325	2 73	223,000	2 76
Ventura	404,825	4 53	430,880	6 64
Yolo	537,065	12 89	547,365	12 45
Yuba	215,028	6 31	213,111	6 24
Totals	24,514,180		25,198,971	

SCHEDULE B.

Showing the aggregate value of all city and town lots in the several counties in 1878.

COUNTIES.	City and town lots.	Improvements on the same.	Total value.
Alameda	\$16,041,695 00	\$7,911,250 00	\$23,952,945 00
Alpine	12,704 00	29,110 00	41,814 00
Amador	102,681 00	234,900 00	337,581 00
Butte	498,005 00	709,395 00	1,207,400 00
Calaveras	38,805 00	144,528 00	183,333 00
Colusa	175,004 00	406,570 00	581,574 00
Contra Costa	180,869 00	248,087 00	428,956 00
Del Norte	37,025 00	87,710 00	124,735 00
El Dorado	92,740 00	195,965 00	288,705 00
Fresno	89,895 00	97,167 00	187,062 00
Humboldt	484,855 00	600,250 00	1,085,105 00
Inyo	26,705 00	133,175 00	159,880 00
Kern	176,081 00	158,145 00	334,226 00
Lake	63,758 00	152,457 00	216,215 00
Lassen	22,145 00	41,235 00	63,380 00
Los Angeles	3,469,557 00	1,841,778 00	5,311,335 00
Marin	852,849 00	586,385 00	1,439,234 00
Mariposa	12,835 00	54,080 00	66,915 00
Mendocino	127,914 00	303,865 00	431,779 00
Merced	168,275 00	175,855 00	344,130 00
Modoc	10,641 00	59,555 00	70,196 00
Mono	26,075 00	101,335 00	127,410 00
Monterey	491,686 00	376,840 00	868,526 00
Napa	661,420 00	792,880 00	1,454,300 00
Nevada	282,505 00	792,575 00	1,075,080 00
Placer	122,202 00	385,585 00	507,787 00
Plumas	29,720 00	127,120 00	156,840 00
Sacramento	3,026,620 00	4,613,030 00	7,639,650 00
San Benito	149,460 00	208,155 00	357,615 00
San Bernardino	138,145 00	153,880 00	292,025 00
San Diego	542,698 00	223,329 00	766,027 00
San Francisco	138,866,391 00	50,682,215 00	189,548,606 00
San Joaquin	1,957,115 00	1,893,295 00	3,850,410 00
San Luis Obispo	265,112 00	233,827 00	498,939 00
San Mateo	443,785 00	220,550 00	664,335 00
Santa Barbara	689,600 00	460,975 00	1,150,575 00
Santa Clara	5,948,210 00	3,339,920 00	9,288,130 00
Santa Cruz	785,115 00	700,635 00	1,485,750 00
Shasta	26,140 00	81,807 00	107,947 00
Sierra	12,335 00	76,300 00	88,635 00
Siskiyou	62,300 00	300,028 00	362,328 00
Solano	869,384 00	754,370 00	1,623,754 00
Sonoma	1,296,993 00	1,654,757 00	2,951,750 00
Stanislaus	147,820 00	228,835 00	376,655 00
Sutter	45,605 00	92,360 00	137,965 00
Tehama	147,900 00	269,055 00	416,955 00
Trinity	14,826 00	47,940 00	62,766 00
Tulare	168,170 00	277,025 00	445,195 00
Tuolumne	84,450 00	182,850 00	267,300 00
Ventura	238,023 00	203,172 00	441,195 00
Yolo	403,332 00	666,994 00	1,070,326 00
Yuba	415,665 00	784,805 00	1,200,470 00
Totals	\$181,043,840 00	\$85,097,906 00	\$266,141,746 00

SCHEDULE B-2.

Showing the aggregate value of all city and town lots in the several counties in 1879.

COUNTIES.	City and town lots.	Improvements on the same.	Total value.
Alameda -----	\$15,697,060 00	\$8,389,195 00	\$24,086,255 00
Alpine -----	9,383 00	16,855 00	26,238 00
Amador -----	113,725 00	238,865 00	352,590 00
Butte -----	491,091 00	733,820 00	1,224,911 00
Calaveras -----	64,286 00	146,858 00	211,144 00
Colusa -----	188,233 00	411,305 00	599,538 00
Contra Costa -----	183,090 00	258,830 00	441,920 00
Del Norte -----	34,280 00	86,260 00	120,540 00
El Dorado -----	93,690 00	199,820 00	293,510 00
Fresno -----	86,760 00	138,375 00	225,135 00
Humboldt -----	499,238 00	633,835 00	1,133,073 00
Inyo -----	19,071 00	92,876 00	111,947 00
Kern -----	103,036 00	117,940 00	220,976 00
Lake -----	61,060 00	149,216 00	210,276 00
Lassen -----	27,312 00	44,120 00	71,432 00
Los Angeles -----	3,382,822 00	1,788,939 00	5,171,761 00
Marin -----	901,385 00	600,085 00	1,501,470 00
Mariposa -----	11,450 00	52,890 00	64,340 00
Mendocino -----	122,070 00	307,925 00	429,995 00
Merced -----	179,577 00	211,845 00	391,422 00
Modoc -----	12,305 00	59,060 00	71,365 00
Mono -----	66,352 00	264,310 00	330,662 00
Monterey -----	445,613 00	353,820 00	799,433 00
Napa -----	676,925 00	817,245 00	1,494,170 00
Nevada -----	287,205 00	810,410 00	1,097,615 00
Placer -----	145,927 00	446,236 00	592,163 00
Plumas -----	27,887 00	121,110 00	148,997 00
Sacramento -----	3,023,320 00	4,635,060 00	7,658,380 00
San Benito -----	134,950 00	206,115 00	341,065 00
San Bernardino -----	140,044 00	163,341 00	303,385 00
San Diego -----	365,565 00	203,651 00	569,216 00
San Francisco -----	122,566,638 00	43,631,015 00	166,197,653 00
San Joaquin -----	1,948,391 00	1,959,270 00	3,907,661 00
San Luis Obispo -----	272,811 00	238,645 00	511,456 00
San Mateo -----	405,445 00	209,875 00	615,320 00
Santa Barbara -----	401,818 00	351,048 00	752,866 00
Santa Clara -----	5,338,320 00	3,085,285 00	8,423,605 00
Santa Cruz -----	710,635 00	619,758 00	1,330,393 00
Shasta -----	35,221 00	93,412 00	128,633 00
Sierra -----	16,775 00	79,570 00	96,345 00
Siskiyou -----	79,540 00	397,000 00	476,540 00
Solano -----	418,505 00	815,474 00	1,233,979 00
Sonoma -----	1,096,397 00	1,565,556 00	2,661,953 00
Stanislaus -----	152,239 00	243,035 00	395,274 00
Sutter -----	41,780 00	87,825 00	129,605 00
Tehama -----	147,355 00	266,085 00	413,440 00
Trinity -----	16,645 00	46,870 00	63,515 00
Tulare -----	129,663 00	246,435 00	376,098 00
Tuolumne -----	98,400 00	215,190 00	313,590 00
Ventura -----	180,943 00	157,880 00	338,823 00
Yolo -----	412,168 00	679,570 00	1,091,738 00
Yuba -----	397,120 00	770,930 00	1,168,050 00
Totals -----	\$162,461,521 00	\$78,459,940 00	\$240,921,461 00

SCHEDULE C.

Showing the total value of real estate, and total value of personal property, and total value of both, as per Assessors' reports for 1878.

COUNTIES.	Total value of real estate.	Total value of personal property.	Total value of all property.
Alameda	\$39,009,858 00	\$3,722,423 00	\$42,732,281 00
Alpine	284,519 00	283,325 00	567,844 00
Amador	1,718,372 00	664,158 00	2,382,530 00
Butte	8,691,802 00	2,091,844 00	10,783,646 00
Calaveras	1,310,974 00	625,472 00	1,936,446 00
Colusa	10,539,971 00	1,776,876 00	12,316,847 00
Contra Costa	6,366,460 00	962,328 00	7,328,788 00
Del Norte	434,289 00	261,661 00	695,950 00
El Dorado	1,576,665 00	752,665 00	2,329,330 00
Fresno	4,410,222 00	1,460,885 00	5,871,107 00
Humboldt	3,873,185 00	1,600,082 00	5,473,267 00
Inyo	731,884 00	640,387 00	1,372,271 00
Kern	3,556,533 00	2,487,480 00	6,044,013 00
Lake	1,639,290 00	533,857 00	2,173,147 00
Lassen	575,833 00	653,371 00	1,229,204 00
Los Angeles	13,597,106 00	2,626,000 00	16,223,106 00
Marin	7,149,906 00	1,352,892 00	8,502,798 00
Mariposa	879,827 00	415,921 00	1,295,748 00
Mendocino	4,001,972 00	1,894,731 00	5,896,703 00
Merced	4,182,104 00	1,126,141 00	5,308,245 00
Modoc	594,965 00	682,904 00	1,277,869 00
Mono	623,350 00	354,715 00	978,065 00
Monterey	6,025,055 00	1,151,716 00	7,176,771 00
Napa	6,726,780 00	1,297,997 00	8,024,777 00
Nevada	5,446,764 00	1,422,854 00	6,869,618 00
Placer	3,718,557 00	1,851,964 00	5,570,521 00
Plumas	1,546,210 00	568,963 00	2,115,173 00
Sacramento	14,008,230 00	4,438,790 00	18,447,020 00
San Benito	3,438,685 00	534,682 00	3,973,367 00
San Bernardino	2,141,748 00	418,090 00	2,559,838 00
San Diego	2,753,379 00	812,006 00	3,565,385 00
San Francisco	191,146,171 00	52,298,380 00	243,444,551 00
San Joaquin	14,506,180 00	2,881,829 00	17,388,009 00
San Luis Obispo	3,337,658 00	994,378 00	4,332,036 00
San Mateo	5,628,285 00	731,825 00	6,360,110 00
Santa Barbara	4,131,625 00	947,913 00	5,079,538 00
Santa Clara	23,914,750 00	3,365,980 00	27,280,730 00
Santa Cruz	5,406,200 00	896,098 00	6,302,298 00
Shasta	1,074,096 00	868,282 06	1,942,378 00
Sierra	1,177,595 00	323,905 00	1,501,500 00
Siskiyou	1,563,764 00	1,124,319 00	2,688,083 00
Solano	7,688,314 00	1,627,216 00	9,315,530 00
Sonoma	12,287,865 00	3,172,889 00	15,460,754 00
Stanislaus	5,058,335 00	1,147,803 00	6,206,138 00
Sutter	3,255,161 00	722,633 00	3,977,794 00
Tehama	2,947,438 00	1,245,200 00	4,192,638 00
Trinity	538,675 00	329,821 00	868,496 00
Tulare	4,229,425 00	1,113,772 00	5,343,197 00
Tuolumne	1,100,325 00	512,935 00	1,613,260 00
Ventura	3,524,716 00	518,653 00	4,043,369 00
Yolo	8,664,093 00	1,533,736 00	10,197,829 00
Yuba	3,086,540 00	1,205,050 00	4,291,590 00
Totals	\$465,821,706 00	\$117,029,797 00	\$582,851,503 00

SCHEDULE C-2.

Showing the total value of real estate, and total value of personal property, and total value of both, as per Assessors' reports for 1879.

COUNTIES.	Total value of real estate.	Total value of personal property.	Total value of all property.
Alameda	\$40,078,215 00	\$3,724,605 00	\$43,802,820 00
Alpine	247,451 00	151,582 00	399,033 00
Amador	2,028,515 00	645,894 00	2,674,409 00
Butte	8,394,320 00	1,793,259 00	10,187,579 00
Calaveras	1,296,496 00	533,369 00	1,829,865 00
Colusa	10,973,765 00	1,572,478 00	12,546,243 00
Contra Costa	6,746,154 00	974,138 00	7,720,292 00
Del Norte	433,218 00	235,833 00	669,051 00
El Dorado	1,573,220 00	758,130 00	2,331,350 00
Fresno	4,363,403 00	1,850,565 00	6,213,968 00
Humboldt	3,854,061 00	1,500,967 00	5,355,028 00
Inyo	573,976 00	411,875 00	985,851 00
Kern	2,720,798 00	1,042,442 00	3,763,240 00
Lake	1,592,248 00	530,727 00	2,122,975 00
Lassen	615,383 00	597,801 00	1,213,184 00
Los Angeles	13,624,725 00	2,536,263 00	16,160,988 00
Marin	6,687,430 00	1,187,937 00	7,875,367 00
Mariposa	887,469 00	412,482 00	1,299,951 00
Mendocino	3,866,087 00	1,642,563 00	5,508,650 00
Merced	4,288,899 00	1,423,758 00	5,712,657 00
Modoc	615,559 00	694,958 00	1,310,517 00
Mono	1,127,175 00	564,604 00	1,691,779 00
Monterey	5,871,274 00	1,233,998 00	7,105,272 00
Napa	6,672,780 00	1,298,146 00	7,970,926 00
Nevada	5,504,417 00	1,316,889 00	6,821,306 00
Placer	4,301,464 00	1,356,805 00	5,658,269 00
Plumas	1,405,304 00	521,111 00	1,926,415 00
Sacramento	13,895,645 00	4,682,740 00	18,578,385 00
San Benito	3,100,153 00	574,450 00	3,674,603 00
San Bernardino	2,147,321 00	430,493 00	2,577,814 00
San Diego	2,421,339 00	739,159 00	3,160,478 00
San Francisco	167,437,885 00	51,411,240 00	218,849,125 00
San Joaquin	15,812,798 00	2,865,616 00	18,678,414 00
San Luis Obispo	3,076,131 00	1,087,045 00	4,163,176 00
San Mateo	5,498,535 00	658,815 00	6,157,350 00
Santa Barbara	3,724,712 00	755,117 00	4,479,829 00
Santa Clara	21,011,880 00	2,934,068 00	23,945,948 00
Santa Cruz	4,827,882 00	789,671 00	5,617,553 00
Shasta	1,151,085 00	812,135 00	1,963,220 00
Sierra	1,128,510 00	307,310 00	1,435,820 00
Siskiyou	1,538,811 00	1,104,441 00	2,643,252 00
Solano	7,046,766 00	1,624,256 00	8,671,022 00
Sonoma	12,051,187 00	3,126,934 00	15,178,121 00
Stanislaus	4,717,236 00	1,314,752 00	6,031,988 00
Sutter	3,312,164 00	594,033 00	3,906,197 00
Tehama	3,336,375 00	1,014,912 00	4,351,287 00
Trinity	576,492 00	322,118 00	898,610 00
Tulare	3,722,363 00	971,887 00	4,694,250 00
Tuolumne	1,147,625 00	501,986 00	1,649,611 00
Ventura	2,343,148 00	528,935 00	2,872,083 00
Yolo	8,555,964 00	1,360,633 00	9,916,597 00
Yuba	3,093,435 00	1,174,815 00	4,268,250 00
Totals	\$437,019,248 00	\$112,221,720 00	\$549,220,968 00

SCHEDULE D.

Showing the kinds of personal property and the assessed value of each kind, in the several counties, in the year 1878.

COUNTIES.	Money on hand or deposit.	Goods, wares, and merchandise.	Steamers and vessels.	WAGONS.		Harness, robes, etc.
				Number.	Value.	
Alameda	\$274,619 00	\$698,377 00	-----	4,297	\$263,100 00	\$33,785 00
Alpine	3,120 00	7,980 00	-----	102	6,040 00	2,144 00
Amador	7,465 00	158,410 00	-----	920	52,128 00	6,650 00
Butte	66,147 00	450,320 00	-----	-----	132,750 00	32,500 00
Calaveras	18,566 00	135,315 00	-----	-----	28,911 00	8,814 00
Colusa	56,628 00	223,660 00	-----	2,472	132,871 00	41,415 00
Contra Costa	15,295 00	100,980 00	-----	-----	66,995 00	4,365 00
Del Norte	12,382 00	50,670 00	-----	-----	5,240 00	3,718 00
El Dorado	47,890 00	134,915 00	-----	162	41,145 00	5,975 00
Fresno	13,759 00	95,745 00	-----	915	53,323 00	10,238 00
Humboldt	52,095 00	283,105 00	-----	1,286	66,875 00	14,464 00
Inyo	4,294 00	155,299 00	-----	-----	44,372 00	13,479 00
Kern	33,921 00	215,292 00	-----	838	56,777 00	22,554 00
Lake	19,434 00	70,540 00	-----	749	50,372 00	9,882 00
Lassen	5,100 00	24,000 00	-----	180	4,500 00	1,000 00
Los Angeles	91,580 00	469,793 00	-----	3,469	187,490 00	37,732 00
Marin	27,551 00	75,300 00	-----	1,069	74,070 00	8,655 00
Mariposa	11,944 00	69,245 00	-----	393	22,900 00	6,244 00
Mendocino	42,871 00	166,088 00	-----	1,467	89,145 00	21,000 00
Merced	25,981 00	85,325 00	-----	1,130	69,010 00	32,475 00
Modoc	13,110 00	48,400 00	-----	687	22,115 00	10,020 00
Mono	6,049 00	37,000 00	-----	250	18,750 00	7,200 00
Monterey	21,968 00	110,500 00	-----	2,090	85,250 00	55,735 00
Napa	44,190 00	228,585 00	-----	1,948	118,780 00	23,938 00
Nevada	50,490 00	469,325 00	-----	-----	88,940 00	11,940 00
Placer	65,511 00	251,136 00	-----	1,194	70,395 00	13,190 00
Plumas	16,581 00	131,380 00	-----	596	37,715 00	9,698 00
Sacramento	251,330 00	1,388,330 00	-----	3,451	219,765 00	37,805 00
San Benito	19,440 00	127,329 00	-----	931	40,500 00	6,000 00
San Bernardino	16,935 00	74,655 00	-----	846	43,640 00	5,125 00
San Diego	37,292 00	86,776 00	-----	-----	42,678 00	9,278 00
San Francisco	6,678,885 00	14,876,090 00	-----	5,420	567,870 00	43,810 00

San Joaquin-----	159,009 00	521,725 00	4,430 00	3,483	218,637 00	44,526 00
San Luis Obispo-----	23,220 00	114,920 00	500 00	993	43,964 00	14,140 00
San Mateo-----	6,810 00	58,725 00	375 00	1,499	78,095 00	18,900 00
Santa Barbara-----	40,903 00	131,410 00	-----	1,261	56,993 00	14,394 00
Santa Clara-----	269,935 00	804,230 00	-----	4,391	250,060 00	47,475 00
Santa Cruz-----	31,853 00	179,865 00	240 00	1,513	69,986 00	17,185 00
Shasta-----	35,458 00	132,510 00	-----	1,051	52,703 00	13,823 00
Sierra-----	14,565 00	108,680 00	-----	299	13,860 00	2,005 00
Siskiyou-----	66,949 00	215,000 00	-----	-----	73,300 00	12,130 00
Solano-----	30,118 00	384,750 00	-----	1,506	43,180 00	12,480 00
Sonoma-----	108,995 00	442,150 00	-----	3,986	205,102 00	36,684 00
Stanislaus-----	30,312 00	112,580 00	-----	1,497	85,120 00	22,783 00
Sutter-----	7,550 00	20,945 00	-----	1,235	75,792 00	16,321 00
Telama-----	17,960 00	134,275 00	-----	1,075	51,580 00	-----
Trinity-----	22,005 00	78,450 00	-----	170	12,860 00	2,650 00
Tulare-----	26,969 00	128,600 00	1,000 00	2,042	78,814 00	11,268 00
Tuolumne-----	19,095 00	91,020 00	-----	655	58,285 00	8,393 00
Ventura-----	11,915 00	92,715 00	500 00	716	53,075 00	7,471 00
Yolo-----	67,666 00	214,075 00	-----	1,607	122,150 00	27,037 00
Yuba-----	59,745 00	302,535 00	-----	1,282	83,160 00	3,420 00
Totals-----	\$9,103,455 00	\$25,779,855 00	\$4,914,855 00	69,595	\$4,538,258 00	\$883,713 00

SCHEDULE D—Continued.

COUNTIES.	HORSES—THOROUGHBRED.		HORSES—AMERICAN.		HORSES—SPANISH AND HALF-BREED.	
	Number.	Value.	Number.	Value.	Number.	Value.
Alameda.....	21	\$14,700 00	3,414	\$172,749 00	4,390	\$113,811 00
Alpine.....	-----	-----	127	8,350 00	146	5,225 00
Amador.....	-----	-----	458	25,792 00	1,935	72,266 00
Butte.....	8	1,700 00	2,455	129,235 00	3,045	110,875 00
Calaveras.....	1	100 00	381	18,050 00	3,220	83,160 00
Colusa.....	23	8,700 00	2,486	130,187 00	3,917	142,025 00
Contra Costa.....	1	2,000 00	3,459	206,150 00	3,149	74,505 00
Del Norte.....	-----	-----	215	13,195 00	262	8,075 00
El Dorado.....	-----	-----	1,415	63,680 00	970	22,675 00
Fresno.....	-----	-----	251	15,922 00	3,183	25,738 00
Humboldt.....	5	5,550 00	900	52,765 00	4,834	123,661 00
Inyo.....	8	1,750 00	240	15,680 00	4,968	67,793 00
Kern.....	-----	-----	619	31,925 00	2,605	83,210 00
Lake.....	3	2,400 00	603	42,310 00	1,463	48,595 00
Lassen.....	-----	-----	177	8,850 00	6,000	90,000 00
Los Angeles.....	39	8,835 00	1,135	79,545 00	7,501	182,051 00
Marin.....	12	4,900 00	800	58,030 00	1,466	46,515 00
Mariposa.....	-----	-----	77	4,835 00	1,408	36,001 00
Mendocino.....	19	3,275 00	1,282	83,743 00	3,888	101,136 00
Merced.....	1	400 00	545	42,237 00	3,074	111,850 00
Modoc.....	18	2,080 00	605	28,445 00	4,087	100,715 00
Mono.....	10	2,300 00	280	18,175 00	2,204	41,880 00
Monterey.....	4	3,000 00	853	51,745 00	4,711	121,348 00
Napa.....	5	2,100 00	1,637	102,785 00	1,912	52,850 00
Nevada.....	1	250 00	770	54,995 00	1,143	43,950 00
Placer.....	-----	-----	1,161	84,891 00	902	27,772 00
Plumas.....	11	2,850 00	922	48,155 00	788	23,867 00
Sacramento.....	10	5,865 00	4,204	265,175 00	3,376	110,390 00
San Benito.....	3	725 00	860	48,651 00	1,250	34,450 00
San Bernardino.....	5	1,000 00	316	14,405 00	2,175	24,414 00
San Diego.....	6	1,000 00	245	14,160 00	3,272	44,306 00
San Francisco.....	2,161	313,345 00	4,648	278,880 00	6,17	19,100 00
San Joaquin.....	53	11,850 00	3,968	208,290 00	6,375	168,960 00
San Luis Obispo.....	-----	-----	558	19,845 00	2,760	62,524 00
San Mateo.....	10	3,250 00	1,193	73,450 00	2,016	52,800 00

Santa Barbara	1	400 00	773	47,095 00	2,628	64,629 00
Santa Clara	37	21,310 00	3,585	240,270 00	5,314	154,253 00
Santa Cruz			525	37,740 00	2,354	63,911 00
Shasta			280	23,800 00	2,642	89,146 00
Sierra					1,192	34,235 00
Siskiyou	5	1,000 00	300	15,000 00	1,800	27,000 00
Solano			2,960	148,000 00	3,356	85,560 00
Sonoma	33	14,605 00	3,299	177,167 00	5,226	149,492 00
Stanislaus	6	3,250 00	583	38,880 00	4,132	124,526 00
Sutter			1,522	94,589 00	3,364	94,573 00
Tehama			4,163	128,945 00		
Trinity			76	7,250 00	956	27,675 00
Tulare	8	1,625 00	373	18,290 00	5,573	122,391 00
Tuolumne			120	7,240 00	2,285	63,703 00
Ventura	3	600 00	477	31,140 00	1,892	49,550 00
Yolo			1,165	107,235 00	4,013	173,445 00
Yuba	5	3,500 00	1,932	100,755 00	1,573	42,190 00
Totals	2,535	\$450,015 00	63,192	\$3,739,273 00	147,312	\$3,844,772 00

Santa Barbara	533	8,488 00	34	2,440 00	2,287	57,410 00	847	10,505 00	1,494	3,386 00
Santa Clara	2,472	44,875 00	83	5,870 00	6,641	151,790 00	786	15,485 00	2,476	15,050 00
Santa Cruz	403	9,415 00			1,112	21,144 00	2,605	38,995 00	859	4,295 00
Shasta	710	9,917 00			1,483	31,682 00			1,506	8,233 00
Sierra							3,198	49,655 00	89	200 00
Siskiyou	960	9,600 00	15	1,125 00			4,300	86,000 00	11,200	56,000 00
Solano	1,200	24,000 00			3,600	72,000 00			3,180	15,900 00
Sonoma	1,327	26,856 00	33	1,720 00	14,337	261,635 00	3,502	51,591 00	4,582	23,005 00
Stanislaus	1,460	20,705 00	3	170 00	1,750	31,334 00	59	1,235 00	1,135	5,178 00
Sutter					1,998	34,802 00				
Tehama	540	2,700 00			2,395	23,950 00			1,158	2,895 00
Trinity	138	2,125 00					413	10,375 00	290	1,160 00
Tulare	1,321	8,925 00					3,226	48,390 00	3,046	15,330 00
Tuolumne	518	8,153 00			519	13,073 00	2,261	33,077 00	1,766	8,833 00
Ventura	512	8,080 00	3	200 00	403	8,610 00	504	7,858 00	278	1,050 00
Yolo	1,423	33,825 00					2,781	73,200 00	1,293	10,421 00
Yuba	720	11,320 00	1	200 00	2,600	40,300 00	580	6,090 00	1,344	7,080 00
Totals	38,411	\$611,367 00	765	\$52,750 00	138,240	\$2,831,120 00	60,006	\$1,031,623 00	83,879	\$423,559 00

SCHEDULE D—Continued.

COUNTIES.	STOCK CATTLE.		BEEF CATTLE.		GOATS.		SHEEP—FINE.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Alameda.....	1,798	\$18,007 00	118	\$1,715 00	240	\$240 00	720	\$2,600 00
Alpine.....	1,277	19,725 00	4	80 00	1	1 00		
Anador.....	4,427	39,530 00			5,829	5,829 00		
Butte.....	7,225	107,365 00	315	6,370 00			410	8,200 00
Calaveras.....	1,399	16,786 00	202	2,424 00	7,997	5,997 00	48	96 00
Colusa.....	2,319	24,027 00	151	2,765 00	781	1,232 00		
Contra Costa.....	5,192	54,005 00	265	6,610 00				
Del Norte.....	777	8,047 00	33	644 00	153	433 00	1	50 00
El Dorado.....	6,907	82,880 00			14,600	22,000 00		
Fresno.....	15,946	158,593 00	600	7,423 00	5,474	5,149 00		
Humboldt.....	14,543	146,160 00	1,654	27,390 00	321	627 00	164,300	248,194 00
Inyo.....	5,272	48,543 00	104	2,012 00	407	435 00		
Kern.....	28,209	323,266 00	5,515	126,618 00			267	3,555 00
Lake.....	1,579	18,285 00			315	5,155 00		
Lassen.....	33,601	333,210 00			659	1,318 00		
Los Angeles.....	5,656	55,079 00	322	4,422 00	807	871 00	5,133	14,030 00
Marin.....	1,244	16,371 00	109	2,390 00	211	233 00		
Mariposa.....	3,398	33,980 00	169	2,860 00				
Mendocino.....	6,941	70,804 00	524	6,072 00	530	723 00	45	900 00
Merced.....	12,145	121,430 00	1,175	21,150 00	261	261 00	630	3,150 00
Modoc.....	24,861	248,610 00	470	8,465 00	205	308 00	42	845 00
Monro.....	10,360	103,600 00	350	7,000 00	215	325 00		
Monterey.....	12,997	90,975 00			546	1,075 00	345	2,587 00
Napa.....	2,150	27,585 00	141	2,820 00	1,660	1,982 00	431	1,910 00
Nevada.....	2,359	27,955 00			1,003	1,795 00		
Placer.....	1,030	11,726 00	254	5,647 00	7,610	7,705 00		
Plumas.....	2,039	21,051 00	253	5,930 00	404	409 00		
Sacramento.....	8,060	87,290 00	200	4,200 00	63	75 00	1,141	4,290 00
San Benito.....	4,074	42,475 00			800	1,000 00		
San Bernardino.....	4,988	25,000 00			1,730	990 00	130	650 00
San Diego.....	11,006	66,635 00	955	7,840 00	1,348	752 00		
San Francisco.....	9,037	93,280 00	236	10,620 00	156	468 00		
San Joaquin.....	15,954	130,796 00	201	4,025 00	656	680 00	1,284	7,368 00
San Luis Obispo.....			1,724	25,375 00				
San Mateo.....	1,657	17,030 00			215	415 00		

Santa Barbara.....	6,849	67,298 00	1,478	20,878 00	896	1,564 00	808	4,525 00
Santa Clara.....	4,938	52,340 00	100	2,015 00	1,750	2,150 00	---	---
Santa Cruz.....	928	9,444 00	166	1,818 00	659	659 00	---	---
Shasta.....	6,976	71,928 00	223	3,725 00	3,514	5,510 00	---	---
Sierra.....	139	1,530 00	---	---	370	575 00	---	---
Siskiyou.....	21,450	214,500 00	2,120	31,800 00	---	---	8	160 00
Solano.....	3,250	26,000 00	450	9,000 00	40	80 00	2,000	10,000 00
Sonoma.....	3,585	33,266 00	689	12,316 00	3,036	3,543 00	74	836 00
Stanislaus.....	3,656	38,557 00	144	1,649 00	645	454 00	9,220	36,860 00
Sutter.....	3,137	23,352 00	---	---	---	---	---	---
Tehama.....	7,449	74,490 00	328	10,250 00	1,300	1,900 00	---	---
Trinity.....	4,340	52,276 00	43	860 00	580	1,160 00	---	---
Tulare.....	9,682	96,820 00	104	1,845 00	1,748	1,748 00	---	---
Tuolumne.....	2,357	35,356 00	---	2,214 00	6,813	6,813 00	---	---
Ventura.....	1,906	14,365 00	---	---	289	387 00	---	---
Yolo.....	1,755	23,155 00	1,001	17,925 00	---	---	---	---
Yuba.....	2,840	27,030 00	---	---	1,250	1,250 00	---	---
Totals.....	356,164	\$3,571,028 00	22,890	\$420,562 00	81,272	\$101,981 00	187,637	\$351,806 00

SCHEDULE D—Continued.

COUNTIES.	SHEEP—COMMON.		LAMBS.		JACKS AND JENNIES.		MULES.		OXEN.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Alameda	23,250	\$25,753 00	3,950	\$1,675 00	5	\$500 00	373	\$16,340 00	27	\$750 00
Alpine	5,463	5,198 00	100	100 00	2	20 00	22	685 00	47	2,442 00
Anaador	21,349	24,005 00	2,000	1,000 00			162	7,885 00	97	4,090 00
Butte	82,070	82,070 00	21,650	8,120 00	17	1,450 00	1,570	92,200 00	350	17,200 00
Calaveras	21,422	21,422 00	8,562	2,140 00	50	500 00	177	7,080 00	80	3,200 00
Colusa	186,340	293,642 00	15,053	3,691 00	29	4,690 00	2,961	156,625 00	20	560 00
Contra Costa	21,062	16,810 00					408	20,960 00		
Del Norte	1,285	1,915 00	149	74 00	2	35 00	78	2,640 00	82	3,070 00
El Dorado	20,700	31,050 00					140	3,980 00	360	12,520 00
Fresno	383,177	584,243 00					418	17,260 00		
Humboldt	4,212	2,106 00					1,059	29,275 00	534	25,435 00
Inyo	20,215	34,120 00			77	655 00	607	31,860 00	149	5,855 00
Kern	224,968	385,159 00	51,316	21,238 00	142	2,289 00	712	32,467 00	95	2,408 00
Lake	46,972	47,285 00	7,776	3,888 00	4	270 00	167	9,695 00	48	1,325 00
Lassen	55,656	55,656 00			8	400 00	189	4,725 00	30	600 00
Los Angeles	246,685	250,250 00			28	885 00	972	34,870 00	22	331 00
Marin	1,272	1,300 00					77	4,910 00	92	387 00
Mariposa	52,236	78,366 00	13,281	6,640 00	78	1,215 00	264	8,219 00	108	4,050 00
Mendocino	218,775	381,129 00	41,759	21,389 00	10	455 00	549	19,431 00	459	22,430 00
Merced	104,100	130,125 00	10,600	5,250 00	36	504 00	574	45,002 00		
Modoc	47,478	71,217 00	820	820 00	22	995 00	364	18,565 00		
Monoc	7,000	7,000 00	400	200 00	8	100 00	125	6,250 00	310	17,050 00
Monterey	90,574	90,863 00			45	1,500 00	560	22,425 00	6	200 00
Napa	47,659	69,894 00	11,882	6,360 00	12	360 00	572	34,370 00	8	300 00
Nevada	5,167	3,860 00	207	105 00			86	4,185 00	181	8,130 00
Placer	64,013	79,652 00	16,275	4,194 00	8	176 00	251	17,145 00	382	15,145 00
Plumas	5,398	6,837 00			12	115 00	114	6,095 00	217	9,810 00
Sacramento	138,116	207,100 00	36,999	27,820 00	6	130 00	334	16,905 00	85	2,630 00
San Benito	35,000	47,875 00					86	5,300 00	6	180 00
San Bernardino	38,685	22,270 00					325	8,675 00	120	2,450 00
San Diego	70,162	69,362 00	20,219	5,203 00	11	193 00	393	7,015 00	75	1,448 00
San Francisco	650	1,300 00					163	13,855 00	25	825 00
San Joaquin	110,797	149,197 00	18,575	8,710 00	46	3,145 00	1,130	51,718 00	15	440 00
San Luis Obispo	99,800	148,000 00	11,310	5,655 00			147	4,180 00		
San Mateo	325	325 00					202	10,045 00	83	3,290 00

Santa Barbara	82,335	135,577 00	19,635	4,882 00	3	400 00	362	10,702 00	30	920 00
Santa Clara	24,471	33,090 00	1,100	650 00	3	310 00	391	19,180 00	30	1,110 00
Santa Cruz	749	734 00			10	50 00	160	6,295 00	309	8,150 00
Shasta	74,538	95,705 00	21,648	8,311 00	16	490 00	173	8,520 00	227	10,005 00
Sierra	156	210 00					68	4,070 00	26	1,080 00
Siskiyou	37,300	74,000 00			30	1,500 00	428	17,120 00	150	3,000 00
Solano	60,000	60,000 00					720	36,000 00		
Sonoma	100,629	100,679 00	24,874	12,499 00	12	536 00	506	24,174 00	129	3,475 00
Stanislaus	151,897	190,851 00	52,363	27,289 00	36	2,495 00	1,263	68,376 00	22	870 00
Sutter	41,844	43,193 00			3	1,200 00	510	43,715 00		
Tehama	269,176	403,764 00	62,400	31,200 00			445	23,207 00		
Trinity	30,744	46,116 00	3,260	1,630 00	16	675 00	292	11,080 00	81	4,050 00
Tulare	203,605	203,605 00			66	760 00	556	20,038 00	36	945 00
Tuolumne	10,380	15,840 00	1,420	1,420 00	20	233 00	133	5,720 00	21	720 00
Ventura	80,209	80,209 00	13,875	3,463 00			213	6,615 00		
Yolo	91,595	99,839 00	305	225 00	7	510 00	877	55,325 00		
Yuba	50,529	70,235 00			2	475 00	384	18,480 00	232	7,870 00
Total	3,808,490	\$5,082,803 00	483,663	\$226,041 00	882	\$30,216 00	23,812	\$1,165,054 00	5,611	\$215,936 00

SCHEDULE D—Continued.

COUNTIES.	HOGS.		BUTTER.		CHEESE.	BEEHIVES.	Libraries.	Farming utensils.
	Number.	Value.	Pounds.	Value.	Pounds.	Value.		
Alameda	2,663	\$8,665 00	4,158	\$1,035 00		25	\$42,300 00	\$20,405 00
Alpine	211	847 00				40	475 00	2,155 00
Anador	4,329	9,435 00					1,345 00	6,747 00
Butte	8,960	12,450 00				640	960 00	41,000 00
Calaveras	3,259	9,717 00	414	82 00	160	311	311 00	5,520 00
Colusa	20,835	60,867 00				108	494 00	67,207 00
Contra Costa	6,185	16,685 00					4,200 00	63,363 00
Del Norte	1,143	3,137 00	36,900	6,796 00	7,800	10	23 00	1,372 00
El Dorado	2,175	8,715 00					4,000 00	6,930 00
Fresno	21,177	56,437 00	19,904	2,750 00		25	385 00	16,757 00
Humboldt	10,009	19,166 00				292	51 00	12,515 00
Inyo	1,517	5,384 00					2,325 00	13,565 00
Kern	8,333	26,295 00					5,092 00	38,960 00
Lake	7,650	18,131 00					1,550 00	5,177 00
Lassen	1,491	4,491 00	15,000	3,000 00	1,000	192	377 00	
Los Angeles	12,559	29,927 00				80	320 00	
Marin	7,448	23,867 00				11,911	26,775 00	34,719 00
Mariposa	6,289	16,453 00	112,602	15,452 00	18,337		5,430 00	11,175 00
Mendocino	15,547	37,853 00				4	10 00	3,718 00
Merced	6,550	19,650 00					8,592 00	18,527 00
Modoc	4,168	6,275 00				355	2,350 00	29,775 00
Mono	280	1,120 00	1,045	209 00		25	450 00	6,125 00
Monterey	7,463	26,541 00	18,000	558 00		50	250 00	9,800 00
Napa	8,567	27,842 00				2,463	5,026 00	22,975 00
Nevada	2,569	10,315 00				68	119 00	17,595 00
Placer	4,741	13,630 00				377	675 00	5,190 00
Plumas	986	4,736 00	2,050	410 00		220	350 00	8,733 00
Sacramento	10,730	31,370 00	100	15 00		269	670 00	12,570 00
San Benito	4,820	7,886 00				240	240 00	64,910 00
San Bernardino	2,775	5,270 00					1,215 00	10,260 00
San Diego	2,222	3,454 00	600	120 00		2,622	4,319 00	7,285 00
San Francisco	1,632	7,470 00	435,000	87,000 00	146,200	26,416	39,129 00	4,900 00
San Joaquin	13,703	33,644 00	440	110 00	5,000		127,730 00	222,380 00
San Luis Obispo	8,159	20,849 00	14,500	1,480 00	22,370	963	1,193 00	48,837 00
San Mateo	2,449	6,870 00				262	262 00	12,914 00
						62	210 00	10,995 00

SCHEDULE D—Continued.

COUNTIES.	GRAIN.		HAY.		WOOL.		COAL.		WATCHES.	
	Tons.	Value.	Tons.	Value.	Pounds.	Value.	Tons.	Value.	Number.	Value.
Alameda	158	\$2,560 00	118	\$840 00	---	---	888	\$5,448 00	1,045	\$31,865 00
Alpine	4	215 00	176	1,439 00	---	---	---	---	50	1,525 00
Anador	27	405 00	---	---	---	---	---	---	128	4,472 00
Butte	3,561	65,500 00	2,753	16,520 00	27,450	\$3,400 00	---	---	---	26,500 00
Calaveras	23	600 00	386	3,860 00	---	---	---	---	485	9,760 00
Colusa	1,152	29,097 00	242	2,106 00	---	---	---	---	---	16,237 00
Contra Costa	663	21,211 00	230	2,300 00	---	---	---	---	335	7,820 00
Del Norte	20	596 00	10	80 00	3,930	581 00	---	---	137	3,444 00
El Dorado	---	---	---	1,350 00	---	---	---	---	---	---
Fresno	100	1,092 00	381	741 00	---	---	---	---	295	7,319 00
Humboldt	533	9,080 00	323	2,860 00	---	---	---	---	388	15,810 00
Inyo	460	23,512 00	448	10,245 00	---	---	1,206	17,526 00	178	6,243 00
Kern	---	---	---	---	---	---	---	---	271	7,790 00
Lake	453	9,467 00	306	3,295 00	---	---	---	---	185	4,916 00
Lassen	86	3,010 00	661	3,305 00	309,200	55,656 00	---	---	50	500 00
Los Angeles	493	7,843 00	634	2,511 00	---	---	150	1,200 00	1,038	22,564 00
Marin	183	5,020 00	135	1,094 00	---	---	55	440 00	141	7,750 00
Mariposa	5	195 00	51	960 00	---	---	---	---	172	5,378 00
Mendocino	208	5,426 00	366	2,731 00	3,530	718 00	---	---	---	18,770 00
Merced	240	7,200 00	100	1,000 00	---	---	---	---	320	11,200 00
Modoc	82	2,055 00	890	1,780 00	---	---	---	---	206	4,932 00
Mono	20	1,200 00	900	4,500 00	---	---	---	---	90	2,700 00
Monterey	763	15,973 00	450	2,655 00	---	---	---	---	1,775	46,345 00
Napa	138	3,585 00	190	1,520 00	---	---	---	---	684	20,510 00
Nevada	---	565 00	204	3,175 00	---	---	---	---	454	20,900 00
Placer	152	2,555 00	299	2,826 00	3,500	1,500 00	---	---	696	31,902 00
Plumas	451	12,695 00	1,391	8,177 00	---	---	---	---	270	10,204 00
Sacramento	545	11,750 00	994	8,730 00	27,500	4,340 00	---	---	1,024	42,730 00
San Benito	---	---	300	1,800 00	---	---	---	---	65	1,630 00
San Bernardino	---	---	---	---	155,500	7,750 00	---	---	190	2,850 00
San Diego	9	215 00	7	70 00	---	---	30	300 00	335	7,724 00
San Francisco	13,000	260,000 00	3,000	30,000 00	1,100,000	110,000 00	31,000	186,000 00	5,139	256,950 00
San Joaquin	2,403	82,873 00	2,561	11,426 00	840	150 00	1,027	6,545 00	1,061	57,255 00
San Luis Obispo	32	634 00	73	2,265 00	---	---	---	---	199	5,092 00
San Mateo	---	---	75	670 00	---	---	---	---	253	5,070 00

SCHEDULE D—Continued.

COUNTIES.	Jewelry or plate.	Household furniture.	Fixtures of saloons.	Musical instruments.	WINES.		BRANDIES AND OTHER LIQUORS.	
					Gallons.	Value.	Gallons.	Value.
Alameda	\$18,550 00	\$874,815 00	\$35,355 00	\$98,250 00		\$11,600 00		\$21,185 00
Alpine	50 00	5,135 00	1,360 00	412 00		10 00		490 00
Anaador		35,653 00	5,855 00	11,925 00	33,650	3,841 00		
Butte	6,450 00	92,000 00	30,500 00	29,400 00	10,500	7,300 00	1,470	2,940 00
Calaveras	1,775 00	36,675 00	10,599 00	5,285 00	6,200	1,240 00	2,550	5,100 00
Colusa	7,031 00	80,997 00	12,460 00	19,956 00				8,293 00
Contra Costa	1,600 00	70,885 00	5,400 00	7,800 00	3,420	684 00		
Del Norte	1,020 00	18,990 00	5,560 00	5,693 00		125 00		1,613 00
El Dorado		60,640 00		8,325 00		13,375 00		3,500 00
Fresno	1,415 00	26,877 00	2,933 00	3,311 00				2,567 00
Humboldt		79,753 00	10,670 00	24,240 00				6,850 00
Inyo	880 00	19,742 00	5,330 00	2,260 00	1,330	1,128 00	1,718	5,189 00
Kern	2,800 00	33,062 00	12,673 00	4,065 00				7,210 00
Lake	265 00	31,065 00	6,286 00	12,415 00				3,055 00
Lassen		15,798 00		2,400 00				
Los Angeles	3,950 00	221,096 00	22,060 00	24,375 00	237,130	26,673 00	2,585	2,240 00
Marin	5,240 00	99,775 00	32,115 00	18,695 00	1,000	265 00		1,750 00
Mariposa	210 00	14,795 00	5,245 00	785 00	980	263 00	2,232	5,580 00
Mendocino	2,555 00	78,651 00	7,265 00	25,111 00				8,870 00
Merced	550 00	35,115 00	4,125 00	13,125 00	10,000	2,500 00		4,750 00
Modoc	810 00	15,170 00	2,275 00	2,005 00				
Mono	365 00	2,260 00	4,140 00	970 00				
Monterey	4,350 00	75,673 00	10,765 00	15,367 00		1,000 00		1,360 00
Napa	1,850 00	167,360 00	5,005 00	34,730 00				
Nevada	7,235 00	146,750 00	16,815 00	33,535 00	196,405	20,425 00	3,665	2,830 00
Placer	4,455 00	92,232 00	2,930 00	25,390 00				14,670 00
Plumas	125 00	38,640 00	3,625 00	9,970 00	24,800	4,455 00		8,769 00
Sacramento		486,515 00	62,890 00	92,615 00				6,184 00
San Benito	200 00	33,500 00	4,800 00	3,400 00				17,130 00
San Bernardino	575 00	33,540 00	10,475 00	6,170 00	5,000	2,000 00	500	1,000 00
San Diego	1,275 00	48,900 00	6,726 00	6,776 00	79,500	6,135 00	820	820 00
San Francisco	177,465 00	4,313,685 00	751,352 00	873,150 00	730	163 00	287	635 00
San Joaquin	3,540 00	202,107 00	31,065 00	67,540 00	408,890	164,111 00		992,368 00
San Luis Obispo	965 00	36,140 00	11,419 00	6,385 00	50,225	10,005 00	15,328	9,064 00
San Mateo	3,660 00	101,275 00	3,070 00	12,150 00			1,433	2,867 00
					2,500	2,500 00	6,025	6,025 00

Santa Barbara	1,795 00	68,374 00	8,450 00	13,458 00	1,025	550 00	48,185 00
Santa Clara	10,910 00	399,615 00	47,500 00	85,320 00	106,750	10,675 00	6,663 00
Santa Cruz	1,495 00	82,194 00	22,967 00	24,065 00	15,090	1,502 00	4,066 00
Shasta	710 00	20,590 00		6,341 00			3,680 00
Sierra	670 00	35,080 00	1,925 00	4,870 00			10,000 00
Siskiyou	800 00	61,872 00	8,300 00	10,625 00			3,000 00
Solano	2,000 00	115,720 00	6,480 00	87,500 00	125,000	18,750 00	8,094 00
Sonoma	3,955 00	248,427 00	123,316 00	65,938 00	882,235	54,014 00	3,861 00
Stanislaus	1,870 00	19,082 00	3,800 00	8,904 00	10,710	2,616 00	3,500 00
Sutter		33,949 00		15,795 00			4,095 00
Tehama	2,416 00	47,785 00	2,450 00	11,103 00			1,125 00
Trinity	3,435 00	11,360 00	1,630 00	3,530 00			1,920 00
Tulare	1,005 00	25,505 00	11,706 00	8,450 00	1,200	300 00	2,193 00
Tuolumne	420 00	36,850 00		11,713 00	47,423	9,485 00	4,157 00
Ventura	1,470 00	36,415 00		8,450 00	8,635	2,150 00	
Yolo	2,965 00	87,375 00	12,325 00	36,330 00	40,312	6,450 00	
Yuba		91,880 00	20,705 00	10,550 00	22,500	2,810 00	1,300 00
Totals	\$309,192 00	\$9,161,341 00	\$1,417,947 00	\$1,920,972 00	2,393,140	\$389,100 00	\$1,260,653 00

SCHEDULE D—Continued.

COUNTIES.	POULTRY.		Fire-arms.	LUMBER.	
	Dozen.	Value.		Thousands.	Value.
Alameda	2,861	\$12,190 00	\$2,450 00	---	\$95,800 00
Alpine	87	522 00	440 00	110	1,166 00
Amador	196	922 00	1,306 00	572	8,190 00
Butte	---	4,170 00	6,250 00	11,110	59,800 00
Calaveras	995	3,980 00	3,010 00	500	10,000 00
Colusa	---	3,925 00	9,406 00	---	16,325 00
Contra Costa	1,890	9,450 00	1,975 00	---	8,350 00
Del Norte	276	920 00	1,884 00	783	6,403 00
El Dorado	646	3,230 00	3,840 00	---	9,650 00
Fresno	642	2,568 00	6,001 00	---	12,976 00
Humboldt	1,417	3,646 00	4,258 00	---	85,430 00
Inyo	431	2,561 00	3,064 00	161	10,625 00
Kern	605	2,158 00	5,300 00	377	9,422 00
Lake	---	3,365 00	8,195 00	---	3,704 00
Lassen	100	500 00	380 00	---	1,352 00
Los Angeles	4,241	12,725 00	6,492 00	1,195	48,660 00
Marin	555	2,640 00	1,160 00	507	14,340 00
Mariposa	442	1,326 00	3,513 00	---	5,002 00
Mendocino	1,625	6,502 00	472	9,494	75,051 00
Merced	2,375	9,500 00	6,500 00	---	7,875 00
Modoc	608	2,545 00	3,670 00	---	---
Mono	100	400 00	940 00	---	1,800 00
Monterey	2,143	6,450 00	2,750 00	---	19,000 00
Napa	1,700	10,180 00	6,470 00	---	2,875 00
Nevada	854	4,270 00	4,380 00	8,000	51,165 00
Placer	1,194	6,444 00	6,906 00	---	28,400 00
Plumas	685	2,524 00	2,415 00	177	3,445 00
Sacramento	3,840	19,200 00	6,740 00	---	---
San Benito	---	2,400 00	---	78	1,026 00
San Bernardino	326	980 00	3,806 00	---	465 00
San Diego	600	2,880 00	31,280 00	---	6,780 00
San Francisco	4,675	23,375 00	8,450 00	61,284	612,840 00
San Joaquin	1,055	2,970 00	3,699 00	---	36,725 00
San Luis Obispo	531	2,655 00	965 00	861	14,285 00
San Mateo	---	---	---	1,818	18,185 00

Santa Barbara	1,202	2,806 00	2,555 00	2,285	27,765 00
Santa Clara	4,111	20,555 00	9,905 00	2,285	12,825 00
Santa Cruz	1,332	5,388 00	2,159 00	1,635	21,977 00
Shasta		2,572 00	6,121 00	2,300	6,325 00
Sierra			740 00		18,000 00
Siskiyou	720	2,880 00	5,600 00	300	34,000 00
Solano	3,000	9,000 00	2,600 00	340	13,935 00
Sonoma	4,202	20,594 00	9,826 00	1,309	7,000 00
Stanislaus	1,836	8,536 00	4,463 00		
Sutter	1,874	7,499 00	3,719 00		
Tehama		1,240 00	1,020 00	25,000	25,000 00
Trinity		1,015 00	2,310 00	155	1,550 00
Tulare	113	339 00	5,564 00		2,380 00
Tuolumne	732	3,660 00	4,626 00	103	1,260 00
Ventura	869	2,262 00	3,607 00	630	11,340 00
Yolo	1,908	7,175 00	4,560 00		17,050 00
Yuba				1,944	20,410 00
Totals	59,684	\$259,704 00	\$240,815 00	133,900	\$1,509,929 00

SCHEDULE D—Continued.

COUNTIES.	Wood.		Machinery.	Railroad rolling stock.	Other personal property.	Total value of all personal property.
	Cords.	Value.				
Alameda	2,300	\$4,657 00	\$216,117 00	\$310,248 00	\$23,288 00	\$3,722,426 00
Alpine	62,181	180,168 00	4,725 00	-----	8,298 00	283,325 00
Amador	4,590	9,855 00	7,295 00	-----	-----	604,158 00
Butte	-----	7,220 00	63,757 00	147,185 00	11,500 00	2,091,844 00
Calaveras	8,600	17,200 00	50,297 00	3,860 00	-----	625,472 00
Colusa	7,365	13,874 00	103,077 00	-----	3,933 00	1,776,876 00
Contra Costa	235	1,410 00	22,878 00	27,000 00	-----	962,328 00
Del Norte	171	532 00	6,333 00	1,750 00	19,806 00	261,661 00
El Dorado	-----	5,375 00	3,000 00	19,745 00	19,385 00	752,665 00
Fresno	1,154	2,381 00	11,500 00	200,170 00	1,625 00	1,460,885 00
Humboldt	610	4,981 00	75,815 00	-----	20,253 00	1,600,082 00
Inyo	-----	-----	11,610 00	-----	-----	640,387 00
Kern	-----	-----	-----	111,810 00	781,388 00	2,487,480 00
Lake	-----	10,946 00	23,224 00	-----	-----	533,857 00
Lassen	1,000	1,000 00	14,600 00	-----	6,000 00	633,371 00
Los Angeles	-----	1,083 00	195,900 00	183,429 00	6,790 00	2,626,000 00
Marin	4,862	8,275 00	26,700 00	104,070 00	104,120 00	1,352,892 00
Mariposa	3,651	7,452 00	16,465 00	-----	9,352 00	415,921 00
Mendocino	4,313	8,709 00	242,452 00	26,500 00	72,494 00	1,894,731 00
Merced	850	3,400 00	75,808 00	110,732 00	1,300 00	1,126,141 00
Modoc	-----	-----	23,660 00	-----	846 00	682,904 00
Mono	-----	900 00	12,049 00	-----	3,000 00	354,715 00
Monterey	640	1,575 00	32,763 00	46,500 00	-----	1,151,716 00
Napa	3,843	6,710 00	48,739 00	47,870 00	18,985 00	1,297,997 00
Nevada	-----	68,060 00	49,670 00	106,930 00	6,319 00	1,422,854 00
Placer	-----	127,465 00	35,430 00	596,297 00	53,496 00	1,851,964 00
Plumas	2,000	2,350 00	16,800 00	-----	20,483 00	508,963 00
Sacramento	-----	-----	316,280 00	163,135 00	160,745 00	4,438,790 00
San Benito	-----	29,760 00	-----	17,000 00	-----	534,682 00
San Bernardino	-----	-----	34,845 00	-----	616 00	418,090 00
San Diego	-----	610 00	35,117 00	137,244 00	-----	812,006 00
San Francisco	7,635	38,175 00	1,591,830 00	156,120 00	13,067,482 00	52,298,380 00
San Joaquin	5,486	11,741 00	141,225 00	197,055 00	49,355 00	2,881,829 00
San Luis Obispo	276	552 00	16,348 00	10,000 00	15,332 00	994,378 00
San Mateo	1,860	1,860 00	37,715 00	24,195 00	1,225 00	731,825 00

Santa Barbara	594	1,294 00	27,848 00	-----	22,870 00	952,913 00
Santa Clara	5,125	17,250 00	140,305 00	-----	132,465 00	3,365,980 00
Santa Cruz	9,274	19,439 00	54,240 00	-----	86,210 00	896,098 00
Shasta	-----	1,638 00	18,198 00	-----	-----	808,282 00
Sierra	-----	-----	11,540 00	-----	-----	323,905 00
Siskiyou	420	840 00	47,700 00	-----	-----	1,124,319 00
Solano	650	1,300 00	140,260 00	-----	3,658 00	1,627,216 00
Sonoma	5,427	7,639 00	87,329 00	-----	121,120 00	3,172,889 00
Stanislaus	2,185	3,873 00	52,185 00	-----	77,051 00	1,147,803 00
Sutter	-----	-----	46,142 00	-----	43,455 00	722,653 00
Tehama	1,150	2,300 00	23,680 00	-----	122,151 00	1,245,200 00
Trinity	150	300 00	28,000 00	-----	-----	329,821 00
Tulare	-----	1,460 00	74,499 00	-----	-----	1,113,772 00
Tuolumne	410	820 00	8,513 00	-----	140 00	512,935 00
Ventura	-----	-----	18,685 00	-----	-----	518,653 00
Yolo	3,571	10,715 00	86,965 00	-----	34,420 00	1,533,736 00
Yuba	740	2,590 00	98,200 00	-----	22,870 00	1,205,050 00
Totals	153,318	\$550,034 00	\$4,509,313 00	\$3,560,823 00	\$14,903,719 00	\$117,034,820 00

SCHEDULE D-2.

Showing the kinds of personal property and the assessed value of each kind, in the several counties, in the year 1879.

COUNTIES.	Money on hand or deposit.	Goods, wares, and merchandise.	Steamers and vessels.	WAGONS.		Harness, robes, etc.
				Number.	Value.	
Alameda	\$79,675 00	\$853,635 00	-----	4,435	\$262,670 00	\$31,977 00
Alpine	3,555 00	8,500 00	-----	50	2,000 00	1,000 00
Anaador	11,625 00	191,230 00	-----	925	53,150 00	6,725 00
Butte	45,256 00	475,003 00	-----	-----	138,000 00	30,000 00
Calaveras	12,980 00	126,240 00	-----	779	20,370 00	6,875 00
Colusa	40,869 00	218,120 00	-----	2,400	126,000 00	38,125 00
Contra Costa	24,896 00	101,800 00	-----	-----	56,550 00	4,425 00
Del Norte	8,624 00	46,525 00	-----	169	7,830 00	3,642 00
El Dorado	51,740 00	154,030 00	-----	1,259	58,090 00	7,625 00
Fresno	18,187 00	122,510 00	-----	-----	55,123 00	12,753 00
Humboldt	70,972 00	260,876 00	-----	1,284	61,789 00	14,399 00
Inyo	1,910 00	88,377 00	-----	469	34,340 00	12,179 00
Kern	16,061 00	169,740 00	-----	866	48,496 00	17,131 00
Lake	17,161 00	66,063 00	-----	863	47,747 00	8,705 00
Lassen	14,748 00	77,928 00	-----	608	21,694 00	8,368 00
Los Angeles	107,208 00	444,408 00	-----	4,045	174,758 00	35,462 00
Marin	17,300 00	65,350 00	-----	1,163	65,015 00	10,305 00
Mariposa	14,475 00	74,890 00	-----	407	22,290 00	6,585 00
Mendocino	26,430 00	177,388 00	-----	1,312	81,166 00	18,505 00
Merced	36,174 00	121,282 00	-----	2,027	66,898 00	18,448 00
Modoc	7,251 00	62,000 00	-----	690	23,460 00	11,040 00
Mono	31,805 00	145,890 00	-----	383	32,635 00	8,603 00
Monterey	18,756 00	105,050 00	-----	2,130	75,851 00	50,340 00
Napa	38,048 00	205,625 00	-----	2,000	115,860 00	20,885 00
Nevada	45,475 00	393,200 00	-----	1,120	82,835 00	10,325 00
Placer	55,902 00	214,658 00	-----	1,199	81,780 00	11,671 00
Plumas	12,146 00	124,700 00	-----	603	37,860 00	7,987 00
Sacramento	704,075 00	1,347,630 00	-----	3,929	216,160 00	22,330 00
San Benito	12,920 00	126,350 00	-----	950	65,500 00	7,000 00
San Bernardino	13,190 00	92,735 00	-----	1,036	41,306 00	7,248 00
San Diego	30,105 00	97,565 00	-----	878	39,976 00	8,812 00
San Francisco	5,578,108 00	12,137,017 00	6,697,433 00	5,188	534,045 00	32,765 00

San Joaquin.....	113,974 00	496,130 00	6,125 00	3,326	227,332 00	51,312 00
San Luis Obispo.....	12,152 00	106,505 00	2,460 00	1,127	48,768 00	15,515 00
San Mateo.....	1,500 00	46,330 00	300 00	1,379	64,240 00	14,375 00
Santa Barbara.....	30,912 00	106,035 00	-----	1,286	56,372 00	12,822 00
Santa Clara.....	186,955 00	708,945 00	-----	3,913	238,745 00	32,965 00
Santa Cruz.....	47,372 00	132,734 00	240 00	1,517	71,735 00	15,336 00
Shasta.....	38,378 00	160,537 00	4,050 00	1,056	53,856 00	14,505 00
Sierra.....	13,920 00	114,825 00	-----	270	18,990 00	2,465 00
Siskiyou.....	67,748 00	199,313 00	-----	-----	68,300 00	14,150 00
Solano.....	28,403 00	466,392 00	-----	1,500	45,000 00	12,420 00
Sonoma.....	118,033 00	361,178 00	-----	4,160	205,021 00	36,777 00
Stanislaus.....	29,608 00	126,960 00	-----	1,687	95,058 00	24,499 00
Sutter.....	750 00	18,875 00	-----	1,175	70,375 00	15,357 00
Tehama.....	20,340 00	153,600 00	-----	1,243	40,060 00	16,620 00
Trinity.....	23,550 00	79,340 00	-----	172	13,320 00	2,700 00
Tulare.....	22,331 00	145,640 00	-----	1,872	73,693 00	12,478 00
Tuolumne.....	45,300 00	142,680 00	-----	-----	44,000 00	6,650 00
Ventura.....	13,341 00	77,920 00	-----	-----	924 00	43,336 00
Yolo.....	28,430 00	204,050 00	-----	1,686	101,175 00	23,125 00
Yuba.....	56,150 00	321,325 00	-----	1,293	87,925 00	4,815 00
Totals.....	\$8,070,004 00	\$23,066,259 00	\$6,779,348 00	71,886	\$4,376,727 00	\$865,282 00

SCHEDULE D-2—Continued.

COUNTIES.	HORSES—THOROUGHBRED.		HORSES—AMERICAN.		HORSES—SPANISH AND HALF-BREED.	
	Number.	Value.	Number.	Value.	Number.	Value.
Alameda	3	\$14,800 00	3,671	\$177,520 00	4,514	\$102,155 00
Alpine	-----	-----	20	2,000 00	146	3,550 00
Anamor	-----	-----	461	24,855 00	2,035	68,275 00
Butte	-----	-----	2,350	120,000 00	2,871	81,000 00
Calaveras	2	300 00	106	5,030 00	2,528	50,560 00
Colusa	20	6,000 00	2,320	116,000 00	3,820	133,700 00
Contra Costa	3	3,000 00	3,704	221,040 00	2,870	77,928 00
Del Norte	-----	-----	135	8,685 00	333	9,905 00
El Dorado	-----	-----	480	46,115 00	1,466	32,505 00
Fresno	2	350 00	331	19,608 00	2,680	93,494 00
Humboldt	-----	-----	1,587	70,800 00	3,171	73,216 00
Inyo	9	1,380 00	170	12,350 00	2,898	58,025 00
Kern	-----	-----	441	21,609 00	2,819	74,332 00
Lake	4	2,500 00	638	42,610 00	1,365	42,587 00
Lassen	28	5,600 00	565	56,500 00	4,279	42,790 00
Los Angeles	41	9,025 00	1,071	60,500 00	7,485	148,015 00
Marin	15	3,400 00	715	40,630 00	1,377	40,800 00
Mariposa	-----	-----	80	4,495 00	1,516	39,420 00
Mendocino	15	2,750 00	1,321	84,090 00	3,196	84,668 00
Merced	2	800 00	748	43,406 00	2,959	87,398 00
Modoc	18	1,800 00	400	20,000 00	3,901	95,980 00
Mono	4	2,000 00	375	25,945 00	1,575	27,020 00
Monterey	3	3,000 00	642	38,520 00	5,267	157,380 00
Napa	7	1,900 00	1,595	105,295 00	2,008	49,770 00
Nevada	1	200 00	830	58,460 00	1,285	44,600 00
Placer	-----	-----	1,286	77,560 00	1,065	33,087 00
Plumas	11	2,695 00	964	53,730 00	648	17,570 00
Sacramento	37	8,500 00	3,861	232,110 00	3,327	100,805 00
San Benito	3	750 00	910	56,360 00	1,245	32,230 00
San Bernardino	14	1,345 00	362	16,605 00	2,219	48,325 00
San Diego	6	550 00	221	11,865 00	3,087	44,072 00
San Francisco	1,917	291,384 00	4,960	317,440 00	673	28,864 00
San Joaquin	59	14,550 00	4,715	233,540 00	6,299	174,379 00
San Luis Obispo	3	850 00	499	26,720 00	3,121	66,293 00
San Mateo	10	3,425 00	1,497	61,770 00	1,641	43,040 00

SCHEDULE D-2—Continued.

COUNTIES.	COWS.		COWS—THOROUGHBREED.		COWS—AMERICAN.		COWS—MIXED AND SPANISH.		CALVES.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Alameda	764	\$12,580 00	28	\$2,680 00	2,853	\$57,849 00	1,843	\$29,213 00	1,202	\$5,795 00
Alpine	40	400 00			10	500 00	143	3,375 00	60	300 00
Amador	465	8,215 00			840	16,820 00	1,710	29,215 00		
Butte	1,200	18,000 00	48	1,000 00	2,648	52,000 00	1,400	24,000 00		
Calaveras							3,606	71,120 00	1,796	10,776 00
Colusa	1,100	22,400 00	30	1,500 00	1,921	38,400 00			250	1,150 00
Contra Costa					4,050	78,988 00			2,376	10,880 00
Del Norte					1,844	39,565 00	320	4,932 00	571	2,870 00
El Dorado	363	6,010 00			3,475	69,500 00			2,400	12,380 00
Fresno	722	9,111 00			165	3,617 00	1,611	35,338 00	750	4,005 00
Humboldt	779	10,354 00			5,405	82,472 00	1,333	20,005 00	5,531	21,808 00
Inyo	264	1,582 00	4	375 00	890	17,860 00	115	1,405 00	1,234	5,583 00
Kern	669	8,028 00			282	6,486 00	1,038	14,456 00	2,188	6,564 00
Lake	372	7,370 00	4	330 00	1,361	30,499 00			1,101	5,593 00
Lassen	772	3,860 00	27	1,080 00	1,338	33,850 00	528	10,370 00	3,960	19,800 00
Los Angeles	1,462	22,103 00	10	500 00	1,338	33,850 00	3,741	71,555 00	1,384	7,349 00
Marin	374	11,255 00	79	3,820 00	22,969	459,380 00	502	7,605 00	2,293	13,146 00
Mariposa	238	2,785 00			45	900 00	769	11,335 00	958	4,790 00
Mendocino	745	11,350 00	20	633 00	2,300	44,229 00			1,707	5,164 00
Merced	889	8,006 00			917	22,926 00	568	10,219 00	1,499	4,498 00
Modoc	210	2,100 00	19	1,900 00	240	3,620 00	590	6,810 00	700	3,500 00
Mono	224	2,061 00			726	13,375 00			684	2,107 00
Monterey	385	3,850 00	19	1,900 00	3,030	48,480 00	3,220	37,965 00	1,315	4,945 00
Napa	679	14,945 00	30	1,420 00	3,667	74,000 00			1,928	9,610 00
Nevada	390	8,020 00	7	700 00	1,193	30,085 00	1,093	28,575 00	1,033	5,960 00
Placer	346	6,232 00	1	90 00	1,837	39,345 00	405	8,128 00	1,055	5,895 00
Plumas	542	9,662 00			2,842	56,567 00	334	5,088 00	1,944	8,583 00
Sacramento	2,209	48,760 00	20	751 00	8,029	164,390 00			2,997	17,130 00
San Benito	500	10,000 00			2,140	36,350 00				
San Bernardino	280	2,545 00	15	700 00	1,767	18,075 00			740	3,245 00
San Diego	305	1,961 00	15	1,000 00	270	4,933 00	1,360	15,308 00	293	1,078 00
San Francisco			52	3,640 00	3,890	81,690 00	203	3,654 00	26	208 00
San Joaquin	2,192	43,067 00	52	2,805 00	3,478	86,950 00	1,052	18,714 00	1,659	10,357 00
San Luis Obispo	1,046	9,833 00			7,334	145,360 00	2,593	41,311 00	3,255	6,965 00
San Mateo	647	12,505 00	80	5,100 00	5,590	111,985 00	431	6,525 00	1,360	7,820 00

Santa Barbara	492	6,170 00	23	1,480 00	1,303	26,593 00	1,544	27,472 00	2,034	4,203 00
Santa Clara	2,023	40,030 00	98	5,310 00	6,732	119,965 00	772	11,650 00	2,503	12,675 00
Santa Cruz	489	10,282 00			445	8,960 00	3,140	47,077 00	846	4,230 00
Shasta	701	9,413 00	3	250 00	1,475	32,450 00			1,305	7,151 00
Sierra							278	31,350 00	19	60 00
Siskiyou	800	12,800 00	10	750 00	3,400	68,000 00	1,000	12,000 00	12,000	60,000 00
Solano	1,283	12,830 00			3,838	76,760 00			1,401	7,005 00
Sonoma	1,496	33,211 00	22	1,355 00	13,666	247,443 00	4,881	75,747 00	4,309	21,553 00
Stanislaus	1,098	17,045 00	1	75 00	1,852	33,601 00			1,363	6,393 00
Sutter					2,158	32,370 00				
Tehama	484	2,420 00			1,865	18,650 00			1,743	4,368 00
Trinity	124	1,920 00					521	11,050 00	320	1,120 00
Tulare	1,315	12,917 00	2	100 00			2,959	44,385 00	2,670	13,350 00
Tuolumne	553	5,530 00			200	5,000 00	1,891	37,820 00	900	4,500 00
Ventura	519	7,671 00	9	545 00	442	8,777 00	677	9,450 00	311	1,490 00
Yolo	1,523	28,950 00			2,734	68,350 00			1,025	9,100 00
Yuba	618	11,770 00			2,032	37,450 00	670	10,050 00	1,256	6,270 00
Totals	34,691	\$551,909 00	728	\$41,809 00	141,488	\$2,757,865 00	48,841	\$834,672 00	84,204	\$393,322 00

SCHEDULE D-2—Continued.

COUNTIES.	STOCK CATTLE.		BEEF CATTLE.		GOATS.		SHEEP—FINE.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Alameda	1,342	\$13,141 00	137	\$2,125 00	144	\$144 00	780	\$3,900 00
Alpine	317	3,170 00	46	690 00			50	250 00
Amador	4,515	40,125 00	50	725 00	5,600	5,600 00		
Butte	6,100	70,000 00	100	2,500 00	800	1,400 00	250	1,000 00
Calaveras	1,205	12,460 00	275	3,300 00	3,100	777 00		
Colusa	1,850	18,500 00	120	1,800 00	670	1,340 00		
Contra Costa	3,237	35,607 00	223	5,306 00	315	315 00		
Del Norte	704	6,865 00	77	1,245 00	140	349 00		
El Dorado	4,600	46,740 00			13,690	19,745 00		
Fresno	12,688	227,810 00	416	6,261 00	4,831	3,814 00		
Humboldt	13,302	128,054 00	1,005	16,007 00	396	643 00		
Inyo	4,851	42,047 00	266	4,968 00	500	500 00	2,045	3,150 00
Kern	21,823	204,664 00	1,659	24,885 00				
Lake	1,668	18,972 00			2,964	5,228 00		
Lassen	9,420	94,200 00	2,880	54,720 00	600	600 00		
Los Angeles	4,403	41,866 00			186	188 00		
Marin	1,966	25,276 00	124	1,782 00	136	165 00		
Mariposa	3,642	36,420 00	118	2,095 00	11,001	15,329 00	200	1,000 00
Mendocino	6,607	62,846 00	335	4,750 00	507	1,181 00	54	889 00
Merced	10,763	107,638 00	140	2,100 00	437	437 00		
Modoc	24,941	249,410 00	520	10,400 00	350	345 00	5	500 00
Mono	6,745	68,420 00	30	400 00	621	621 00		
Monterey	11,454	103,086 00			340	340 00		
Napa	2,492	29,170 00			1,406	1,415 00	16	110 00
Nevada	2,196	26,850 00						
Placer	993	11,300 00	84	1,950 00	2,013	2,495 00		
Plumas	1,858	19,231 00	256	4,626 00	7,668	6,964 00	384	1,162 00
Sacramento	3,576	62,195 00	127	2,982 00				
San Benito	4,867	38,785 00	163	2,165 00	1,514	2,935 00	1,502	3,675 00
San Bernardino	3,805	24,435 00			500	750 00		
San Diego	8,516	53,929 00			115	55 00	30	50 00
San Francisco			5	155 00	1,699	1,030 00		
San Joaquin	7,747	77,470 00	211	8,862 00	290	580 00		
San Luis Obispo	11,999	122,758 00	278	4,170 00	1,140	950 00	1,542	7,600 00
San Mateo	1,348	12,710 00	428	5,716 00	435	430 00	170	650 00
					360	375 00	11	110 00

Santa Barbara	7,027	69,775 00	63	960 00	240	400 00	
Santa Clara	6,068	60,680 00	130	2,350 00	2,365 00	2,365 00	1,000 00
Santa Cruz	873	9,393 00	88	1,670 00	379	379 00	
Shasta	7,010	70,100 00	210	3,780 00	4,200	7,350 00	
Sierra	2,496	3,230 00			425	625 00	
Siskiyou	23,000	230,000 00	2,100	31,500 00			150 00
Solano	4,825	48,250 00			4	8 00	
Sonoma	3,504	34,588 00	362	5,838 00	2,067	4,620 00	430 00
Stanislaus	2,762	27,620 00			456	358 00	27,035 00
Sutter	2,850	20,225 00					
Tehama	5,410	54,100 00			1,700	1,700 00	
Trinity	3,870	42,196 00	47	846 00		918 00	
Tulare	5,119	51,190 00			1,256	683 00	
Tuolumne	2,650	39,750 00	31	620 00	700	700 00	
Ventura	858	6,769 00			437	485 00	
Yolo	1,475	20,205 00	901	18,025 00			
Yuba	2,800	22,400 00	42	840 00	800	720 00	
Totals	230,207	\$2,946,621 00	14,047	\$243,014 00	80,109	\$98,351 00	\$52,661 00

SCHEDULE D-2—Continued.

COUNTIES.	SHEEP—COMMON.		LAMBS.		JACKS AND JENNIES.		MULES.		OXEN.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Alameda	13,875	\$15,590 00	3,100	\$1,050 00	6	\$500 00	461	\$22,160 00	12	\$600 00
Alpine	600	1,200 00	40	20 00	1	20 00	10	500 00	12	4,230 00
Anaador	22,450	25,125 00	1,500	750 00	1	200 00	161	7,625 00	95	9,000 00
Butte	100,000	100,000 00	20,000	5,000 00	20	1,500 00	1,200	30,000 00	200	9,000 00
Calaveras	47,000	47,000 00	8,495	2,123 00	38	380 00	161	4,830 00	50	1,250 00
Colusa	176,240	176,240 00	12,050	3,012 00	24	4,080 00	3,065	183,900 00	10	300 00
Contra Costa	26,074	26,074 00					433	22,560 00		
Del Norte	1,668	1,668 00	194	97 00			103	3,675 00	59	1,895 00
El Dorado	23,238				30	525 00	74	3,340 00	212	9,420 00
Fresno	412,337	412,838 00			81	1,695 00	366	13,270 00	30	820 00
Humboldt	174,211	221,958 00					1,049	36,115 00	410	18,386 00
Inyo	5,398	6,659 00	650	338 00	26	360 00	428	19,417 00	136	5,992 00
Kern	182,802	137,101 00	33,804	8,451 00	218	2,398 00	743	31,949 00		
Lake	41,574	62,202 00			3	155 00	134	9,536 00	62	1,246 00
Lassen	48,740	48,740 00			2	800 00	64	3,440 00	88	3,420 00
Los Angeles	377,154	388,923 00			19	635 00	919	29,215 00		
Marin	1,019	1,280 00					80	3,435 00	82	3,100 00
Mariposa	47,630	47,630 00	19,952	9,976 00	84	1,075 00	291	8,780 00	55	2,062 00
Monterey	327,366	330,769 00	78,595	29,283 00	9	670 00	441	15,465 00	351	15,450 00
Mendocino	250,278	250,278 00	80,290	43,145 00	15	345 00	1,009	50,462 00	40	1,800 00
Merced	41,627	54,318 00	1,100	1,100 00	22	1,100 00	364	18,565 00	250	7,500 00
Mono	3,852	4,020 00	102	36 00	41	420 00	153	8,890 00	348	12,140 00
Monterey	80,750	80,750 00					645	32,258 00		
Napa	42,485	43,540 00	14,092	7,150 00	11	350 00	514	28,610 00		
Nevada	4,044	4,465 00	384	190 00			79	4,505 00	164	6,645 00
Placer	69,593	67,309 00	12,489	3,024 00	5	560 00	254	11,780 00	54	2,205 00
Plumas	4,567	5,356 00			12	265 00	94	5,485 00	123	4,480 00
Sacramento	124,209	127,165 00	30,035	17,600 00	13	2,470 00	326	17,210 00	199	6,620 00
San Benito	58,700	58,700 00					90	5,400 00	4	120 00
San Bernardino	55,900	26,100 00			30	210 00	188	5,610 00	88	1,760 00
San Diego	91,304	68,605 00			9	155 00	325	6,251 00	50	970 00
San Francisco	263	526 00					65	3,640 00	32	992 00
San Joaquin	26,672	77,807 00	15,138	9,008 00			1,281	64,202 00	2	60 00
San Luis Obispo	113,595	159,667 00	30,220	15,835 00	30	4,200 00	203	14,252 00		
San Mateo	3,625	3,625 00					185	9,745 00	80	2,300 00

Santa Barbara	78,244	56,173 00	44,963	9,522 00	8	500 00	354	10,485 00	32	580 00
Santa Clara	20,580	20,580 00	2,190	1,095 00	10	320 00	249	11,605 00	44	1,215 00
Santa Cruz	1,947	1,947 00	47	33 00	11	60 00	144	4,890 00	290	8,130 00
Shasta	45,615	57,520 00	13,190	4,946 00	10	1,100 00	188	9,400 00	167	7,364 00
Sierra	1,243	1,230 00	---	---	---	---	57	3,155 00	44	1,830 00
Siskiyou	33,000	66,000 00	---	---	20	1,600 00	600	24,000 00	150	3,000 00
Solano	70,849	70,849 00	---	---	5	1,000 00	723	36,150 00	30	1,500 00
Sonoma	120,965	120,965 00	40,398	20,199 00	5	115 00	458	21,895 00	134	3,338 00
Stanislaus	139,921	139,921 00	58,045	30,734 00	30	3,745 00	1,533	69,800 00	30	400 00
Sutter	38,560	38,560 00	---	---	1	300 00	625	40,725 00	---	---
Tehama	224,664	224,664 00	72,984	18,246 00	6	600 00	988	46,059 00	140	4,200 00
Trinity	24,000	36,000 00	3,600	1,800 00	14	602 00	324	13,284 00	85	4,250 00
Tulare	181,587	91,827 00	---	---	40	355 00	531	15,810 00	67	1,750 00
Tuolumne	12,818	19,227 00	---	---	22	220 00	200	14,000 00	20	600 00
Ventura	82,090	81,715 00	21,485	5,399 00	---	---	224	7,254 00	---	---
Yolo	79,921	91,910 00	543	375 00	6	2,050 00	767	52,310 00	---	---
Yuba	54,575	54,575 00	---	---	4	1,040 00	340	17,000 00	170	3,315 00
Totals	4,266,919	\$4,262,891 00	625,075	\$259,537 00	912	\$38,675 00	24,263	\$1,133,899 00	4,689	\$665,535 00

SCHEDULE D-2—Continued.

COUNTIES.	HOGS.		BUTTER.		CHEESE.		BEEHIVES.		Libraries.	Farming utensils.
	Number.	Value.	Pounds.	Value.	Pounds.	Value.	Number.	Value.		
Alameda	2,678	\$5,479 00					30	\$60 00	\$31,415 00	\$21,325 00
Alpine	40	200 00					20	60 00	600 00	2,500 00
Amador	4,250	8,500 00	3,000	\$600 00			100	50 00	1,300 00	6,800 00
Butte	8,000	15,000 00							4,000 00	35,000 00
Calaveras	2,875	5,750 00	300	60 00	200	\$20 00	296	296 00	972 00	6,560 00
Colusa	18,220	36,440 00					100	200 00	3,500 00	65,200 00
Contra Costa	6,408	16,717 00							2,840 00	63,585 00
Del Norte	974	2,662 00	34,300	5,393 00	11,000	830 00	13	28 00	1,420 00	1,255 00
El Dorado	3,100	9,370 00					250	250 00	2,610 00	8,800 00
Fresno	19,436	30,741 00					164	408 00	1,522 00	23,593 00
Humboldt	9,873	14,132 00	11,200	1,120 00					4,520 00	9,866 00
Inyo	1,790	5,782 00	75	22 00			375	2,518 00	1,245 00	11,377 00
Kern	12,422	24,844 00							2,175 00	12,900 00
Lake							294	603 00	1,586 00	4,922 00
Lassen	918	2,757 00	7,000	1,050 00			450	900 00	450 00	17,021 00
Los Angeles	12,147	25,315 00					20,137	39,273 00	11,680 00	32,100 00
Marin	7,072	14,047 00	78,380	8,820 00					4,780 00	9,535 00
Mariposa	8,384	17,421 00					5	10 00	545 00	4,468 00
Merced	12,571	20,528 00	187	37 00			377	754 00	5,112 00	18,664 00
Mendocino	9,447	18,894 00	800	80 00			25	125 00	3,200 00	44,454 00
Modoc	4,254	8,508 00	3,200	640 00			60	284 00	1,000 00	7,060 00
Mono	657	3,886 00	300	60 00			3,145	3,145 00	820 00	6,635 00
Monterey	10,167	25,417 00					130	130 00	3,075 00	24,750 00
Napa	8,373	14,535 00			7,900	540 00	302	450 00	5,250 00	15,360 00
Nevada	2,061	7,875 00	300	35 00			262	419 00	9,380 00	4,975 00
Placer	4,578	46,381 00					239	485 00	1,980 00	10,886 00
Plumas	955	3,865 00	1,450	233 00					2,855 00	9,267 00
Sacramento	8,677	22,075 00	420	150 00					1,980 00	9,267 00
San Benito	4,720	6,625 00							25,525 00	50,900 00
San Bernardino	2,700	4,065 00							1,000 00	10,200 00
San Diego	2,816	5,632 00	400	60 00			4,168	5,910 00	3,480 00	6,990 00
San Francisco	1,984	8,432 00	316,000	94,800 00	112,000	11,200 00	27,107	34,964 00	2,715 00	6,699 00
San Joaquin	10,584	30,428 00			1,000	80 00			114,910 00	193,280 00
							940	1,290 00	11,580 00	59,778 00

San Luis Obispo	14,252	23,367 00	14,750	1,257 00	19,500	1,504 00	802	737 00	4,401 00	12,162 00
San Mateo	2,615	5,230 00			3,000	300 00	260	260 00	3,665 00	9,005 00
Santa Barbara	12,883	20,919 00					2,851	2,851 00	7,025 00	11,034 00
Santa Clara	8,963	22,360 00			18,675	1,140 00	140	140 00	19,935 00	27,880 00
Santa Cruz	2,359	5,738 00	7,160	770 00	22,825	1,533 00			3,135 00	9,432 00
Shasta	10,560	26,294 00					100	125 00	1,200 00	11,050 00
Sierra	163	740 00							1,100 00	4,915 00
Siskiyou	1,600	3,200 00					1,100	3,300 00	1,200 00	20,200 00
Solano	11,169	22,338 00							3,000 00	36,800 00
Sonoma	17,022	30,033 00	4,100	366 00	6,500	285 00	202	202 00	11,070 00	24,870 00
Stanislaus	9,908	16,444 00					583	813 00	1,980 00	25,924 00
Sutter	16,800	30,550 00							800 00	16,238 00
Tehama	8,058	19,728 00							840 00	26,855 00
Trinity	1,114	3,400 00							300 00	2,670 00
Tulare	18,372	36,756 00					1,366	2,732 00	3,055 00	14,762 00
Tuolumne	3,107	9,321 00							750 00	2,000 00
Ventura	21,338	24,089 00					5,494	7,613 00	1,760 00	8,933 00
Yolo	19,960	58,890 00								31,125 00
Yuba	6,110	13,440 00								22,225 00
Totals	379,484	\$835,135 00	483,222	\$115,553 00	202,600	\$27,432 00	71,887	\$111,415 00	\$338,348 00	\$1,124,855 00

SCHEDULE D-2—Continued.

COUNTIES.	GRAIN.		HAY.		WOOL.		COAL.		WATCHES.	
	Tons.	Value.	Tons.	Value.	Pounds.	Value.	Tons.	Value.	Number.	Value.
Alameda	4,400	\$31,005 00	43,320	\$31,985 00			1,230	\$7,350 00	1,013	\$26,750 00
Alpine	4	80 00	36	360 00					18	756 00
Anaador	200	3,000 00	80	300 00					105	3,125 00
Butte	500	10,000 00	300	1,500 00						
Calaveras	25	750 00	225	2,250 00					395	5,725 00
Colusa	1,050	21,000 00	220	2,200 00						15,230 00
Contra Costa	698	18,864 00	1,060	6,360 00						8,020 00
Del Norte	10	300 00	9	90 00	2,100	\$270 00			136	3,454 00
El Dorado									408	13,710 00
Fresno	377	2,285 00	806	3,155 00					268	5,811 00
Humboldt	429	5,504 00	215	1,910 00					388	12,925 00
Inyo	477	22,751 00	1,852	413 00			346	4,870 00	130	3,910 00
Kern									217	7,161 00
Lake	366	7,135 00	285	2,186 00					180	5,463 00
Lassen	280	5,600 00	2,955	5,910 00	56,000	5,600 00			269	5,580 00
Los Angeles	2,912	29,102 00	532	2,039 00					1,112	20,624 00
Marin	242	3,535 00	233	1,886 00			150	540 00	222	9,895 00
Mariposa	38	830 00	314	3,737 00					140	4,207 00
Mendocino	325	6,508 00	528	4,231 00						13,689 00
Merced	11,128	227,013 00	2,310	5,777 00					461	7,835 00
Modoc	194	2,725 00	900	1,800 00					222	4,884 00
Mono	9	580 00	205	3,115 00					154	5,487 00
Monterey	10,840	70,280 00							2,643	39,645 00
Napa	75	1,080 00	662	3,160 00					601	16,140 00
Nevada	6	195 00	97	1,730 00					400	20,555 00
Placer			300	2,444 00					778	30,027 00
Plumas	362	8,021 00	2,005	8,112 00					236	7,796 00
Sacramento	1,343	18,845 00	1,707	11,110 00	9,150	1,065 00			997	37,480 00
San Benito	150	30,000 00	1,100	3,300 00					85	1,675 00
San Bernardino					111,800	5,500 00			239	5,155 00
San Diego	594	5,940 00					325	2,950 00	306	6,753 00
San Francisco	8,000	96,000 00	3,200	32,000 00	70,000	7,000 00	40,000	240,000 00	4,896	225,308 00
San Joaquin	4,862	86,408 00	3,174	15,732 00	1,400	130 00	845	6,200 00	1,179	38,388 00
San Luis Obispo	301	2,710 00	675	2,288 00					229	5,714 00
San Mateo	36	500 00	184	920 00					169	3,810 00

SCHEDULE D-2—Continued.

COUNTIES.	Jewelry or plate.	Household furniture.	Fixtures of saloons.	Musical instruments.	WINES.		BRANDIES AND OTHER LIQUORS.	
					Gallons.	Value.	Gallons.	Value.
Alameda	\$15,890 00	\$774,140 00	\$40,880 00	\$116,195 00	200	\$12,440 00	50	\$16,400 00
Alpine	120 00	1,400 00	1,345 00	192 00	35,450	100 00		175 00
Anamor		38,750 00	6,750 00	10,575 00	10,000	3,884 00	1,000	2,500 00
Butte		20,000 00	22,000 00	25,000 00	15,000	5,000 00	1,985	3,370 00
Calaveras	2,808 00	20,805 00	6,125 00	4,211 00		3,000 00		7,250 00
Colusa	6,500 00	75,850 00	11,520 00	18,850 00	3,875	582 00		
Contra Costa	1,575 00	58,960 00	5,320 00	6,130 00	222	355 00	1,023	2,550 00
Del Norte	995 00	17,320 00	5,065 00	7,055 00	140,000	14,000 00	2,600	2,600 00
El Dorado	1,195 00	58,135 00	4,905 00	13,840 00	12,038	3,635 00	1,952	4,036 00
Fresno	853 00	31,408 00	3,217 00	6,192 00				5,260 00
Humboldt		77,087 00	9,300 00	26,830 00	351	212 00	1,492	2,405 00
Inyo	720 00	15,935 00	3,100 00	1,155 00				5,022 00
Kern		30,756 00	8,260 00	4,847 00				2,370 00
Lake	905 00	33,019 00	7,595 00	12,515 00				156 00
Lassen	450 00	5,068 00	5,200 00	12,140 00				1,225 00
Los Angeles	3,890 00	242,800 00		31,594 00	117,400	12,880 00		1,925 00
Marin	5,810 00	89,210 00	27,092 00	17,370 00	2,500	250 00		2,050 00
Mariposa	350 00	14,420 00	5,975 00	1,285 00	3,330	825 00	2,332	4,665 00
Mendocino	1,995 00	73,597 00	7,485 00	25,601 00			3,037	5,186 00
Merced		35,632 00	3,312 00	7,950 00				
Modoc	940 00	23,000 00	2,180 00	2,145 00				
Mono	2,205 00	18,560 00	13,350 00	830 00			3,185	10,452 00
Monterey	4,500 00	79,580 00	12,150 00	29,700 00				
Napa	2,750 00	152,110 00	5,000 00	36,325 00	688,350	87,640 00	8,171	3,738 00
Nevada	6,340 00	111,390 00	19,150 00	36,620 00	4,420	1,05 00		11,625 00
Placer	4,018 00	95,670 00	2,610 00	24,060 00	10,850	1,790 00	860	860 00
Plumas		37,530 00	5,245 00	11,450 00				490 00
Sacramento	9,525 00	512,765 00	56,900 00	89,810 00	88,687	20,855 00		
San Benito	200 00	11,600 00	2,500 00	2,900 00	25,000	2,550 00	500	1,000 00
San Bernardino	1,280 00	28,660 00	8,925 00	8,720 00				400 00
San Diego	780 00	30,343 00	6,280 00	6,190 00	500	115 00	444	911 00
San Francisco		3,604,035 00	731,027 00	603,750 00	398,700	98,610 00		437,355 00
San Joaquin	3,735 00	243,474 00	40,025 00	79,110 00	37,980	7,880 00	9,300	5,295 00
San Luis Obispo	1,370 00	32,293 00	16,306 00	4,599 00				2,381 00
San Mateo	2,925 00	99,280 00	2,345 00	11,920 00				

Santa Barbara	2,065 00	65,650 00	7,400 00	1,250 00	73,050	7,395 00	52,405	52,405 00
Santa Clara	8,565 00	317,495 00	47,300 00	82,835 00	5,070	530 00	2,832	5,905 00
Santa Cruz	625 00	68,664 00	10,690 00	18,840 00	3,000	750 00	500	1,000 00
Shasta	800 00	21,560 00	2,600 00	6,405 00				1,850 00
Sierra	2,975 00	43,990 00	400 00	7,500 00				
Siskiyou	800 00	50,000 00	10,000 00	15,000 00				
Solano	5,000 00	120,000 00	2,000 00	25,750 00	21,600	3,690 00	300	600 00
Sonoma	6,018 00	250,551 00	149,354 00	60,484 00	1,068,800	57,635 00	6,132	7,107 00
Stanislaus	1,250 00	23,300 00	3,150 00	15,845 00				4,497 00
Butter		35,850 00		16,500 00				
Tehama	1,383 00	37,981 00	2,620 00	8,709 00				
Trinity	3,700 00	13,450 00	1,700 00	3,900 00				1,400 00
Tulare	970 00	28,874 00	6,110 00	12,760 00	3,810	1,185 00	1,715	1,715 00
Tuolumne	1,500 00		4,420 00	12,500 00	30,000	6,000 00	2,900	4,350 00
Ventura	555 00	34,471 00	5,260 00	7,410 00	2,526	2,526 00	891	1,587 00
Yolo	1,475 00	84,560 00	12,005 00	37,025 00		5,560 00		
Yuba		100,030 00	14,430 00	25,020 00	8,000	1,000 00	1,600	1,600 00
Totals	\$122,325 00	\$8,091,008 00	\$1,387,938 00	\$1,655,099 00	2,744,609	\$368,329 00	108,434	\$626,343 00

SCHEDULE D-2—Continued.

COUNTIES.	POULTRY.		FIRE-ARMS.	LUMBER.	
	Dozen.	Value.		Thousands.	Value.
Alameda	3,084	\$11,378 00	59,875 00	-----	\$91,195 00
Alpine	46	286 00	200 00	17	170 00
Anamor	180	750 00	1,350 00	705,225	8,460 00
Butte	-----	7,500 00	4,500 00	7,000,000	100,000 00
Calaveras	1,625	6,500 00	4,118 00	825	16,500 00
Colusa	-----	2,520 00	7,775 00	-----	30,300 00
Contra Costa	2,055	8,220 00	1,845 00	-----	8,800 00
Del Norte	235	784 00	1,783 00	398	3,676 00
El Dorado	634	3,170 00	4,715 00	1,400	9,800 00
Fresno	1,437	4,131 00	9,543 00	-----	2,578 00
Humboldt	1,003	3,011 00	3,486 00	-----	135,036 00
Inyo	457	2,660 00	2,565 00	109	4,302 00
Kern	-----	2,920 00	4,801 00	242,000	4,840 00
Lake	-----	3,205 00	6,803 00	-----	4,295 00
Lassen	-----	-----	1,280 00	-----	35,750 00
Los Angeles	4,646	13,939 00	6,193 00	715,000	55,615 00
Marin	1,085	5,197 00	1,600 00	3,084,111	12,780 00
Mariposa	565	1,695 00	3,453 00	880	1,873 00
Mendocino	1,392	5,567 00	10,380 00	-----	73,149 00
Merced	991	3,064 00	3,199 00	9,150	3,400 00
Modoc	700	2,800 00	2,070 00	-----	2,922 00
Monro	101	536 00	987 00	-----	19,237 00
Monterey	4,567	13,701 00	2,840 00	2,600	39,000 00
Napa	2,107	10,525 00	5,225 00	-----	13,105 00
Nevada	774	3,870 00	2,930 00	5,751	47,510 00
Placer	1,777	7,832 00	6,950 00	-----	28,580 00
Plumas	630	3,196 00	2,266 00	981	4,065 00
Sacramento	4,050	20,250 00	6,350 00	-----	-----
San Benito	-----	1,155 00	-----	150	1,500 00
San Bernardino	332	-----	1,338 00	-----	3,750 00
San Diego	-----	1,019 00	2,921 00	-----	6,080 00
San Francisco	1,025	4,307 00	28,410 00	52,690,000	526,900 00
San Joaquin	5,153	25,765 00	7,890 00	-----	41,336 00
San Luis Obispo	1,479	3,837 00	4,353 00	724	16,033 00
San Mateo	453	2,265 00	795 00	2,401	24,010 00

Santa Barbara	1,454	2,908 00	1,936 00	730	8,760 00
Santa Clara	5,137	20,570 00	6,900 00	3,087	28,230 00
Santa Cruz	1,706	6,824 00	1,741 00	1,318	7,950 00
Shasta	750	3,000 00	6,500 00	500	4,125 00
Sierra	700	2,800 00	715 00		5,790 00
Siskiyou		8,000 00	3,500 00		24,000 00
Solano	4,463	21,264 00	10,000 00		30,000 00
Sonoma	1,894	10,470 00	10,420 00	1,694,665	15,478 00
Stanislaus	875	3,500 00	4,026 00		1,225 00
Sutter	145	1,240 00	1,500 00		
Tehama		850 00	875 00	2,000	16,000 00
Trinity	143	431 00	2,340 00	175	1,750 00
Tulare	95	475 00	3,732 00		2,075 00
Tuolumne	1,102	2,867 00	6,000 00		
Ventura	1,342	5,026 00	2,928 00	268	5,149 00
Yolo			4,060 00		16,750 00
Yuba				760	8,360 00
Totals	62,389	\$278,690 00	\$232,112 00	66,135,395	\$1,552,189 00

SCHEDULE D-2—Continued.

COUNTIES.	Wood.		Machinery.	Railroad rolling stock.	Other personal property.	Total value of all personal property.
	Cords.	Value.				
Alameda	---	\$3,100 00	\$221,240 00	\$347,223 00	\$34,693 00	\$3,724,605 00
Alpine	11,265	28,152 00	81,000 00	---	546 00	151,582 00
Anaador	4,100	8,200 00	8,315 00	---	30,250 00	645,894 00
Butte	---	6,400 00	100,000 00	146,000 00	1,944 00	1,793,259 00
Calaveras	125	250 00	17,874 00	524 00	16,690 00	553,369 00
Colusa	---	10,350 00	108,220 00	---	5,292 00	1,372,478 00
Contra Costa	---	950 00	21,980 00	20,000 00	428 00	974,138 00
Del Norte	70	85 00	7,503 00	2,150 00	17,201 00	235,833 00
El Dorado	4,200	4,725 00	2,500 00	2,050 00	31,530 00	758,130 00
Fresno	329	1,756 00	18,261 00	629,630 00	6,004 00	1,850,565 00
Humboldt	---	---	57,411 00	---	---	1,500,907 00
Inyo	407	2,744 00	7,157 00	---	---	411,875 00
Kern	---	---	19,485 00	111,810 00	---	1,042,442 00
Lake	---	23,235 00	16,513 00	---	10,000 00	530,727 00
Lassen	---	---	19,640 00	---	1,411 00	597,801 00
Los Angeles	20	40 00	189,345 00	183,529 00	4,135 00	2,536,263 00
Marin	1,783	3,735 00	30,870 00	95,070 00	41,947 00	1,187,937 00
Mariposa	3,413	8,343 00	16,030 00	---	9,648 00	412,482 00
Mendocino	1,970	3,940 00	159,411 00	33,100 00	17,435 00	1,642,563 00
Merced	2,718	5,437 00	44,135 00	110,732 00	2,000 00	1,423,758 00
Modoc	---	---	27,000 00	---	9,000 00	649,938 00
Mono	10,459	32,026 00	40,320 00	---	1,783 00	564,644 00
Monterey	---	---	25,728 00	50,035 00	---	1,233,998 00
Napa	5,250	11,360 00	45,080 00	46,560 00	61,380 00	1,298,146 00
Nevada	26,020	50,700 00	54,285 00	113,509 00	8,200 00	1,316,889 00
Placer	---	71,624 00	22,465 00	251,536 00	47,918 00	1,356,805 00
Plumas	758	1,027 00	2,555 00	---	34,113 00	521,111 00
Sacramento	---	---	306,480 00	165,145 00	193,965 00	4,682,740 00
San Benito	---	---	20,000 00	17,000 00	---	374,450 00
San Bernardino	---	---	28,175 00	---	23,505 00	430,493 00
San Diego	420	180 00	31,004 00	157,244 00	---	739,139 00
San Francisco	2,100	10,500 00	1,528,195 00	213,250 00	16,347,853 00	51,411,240 00
San Joaquin	5,250	10,200 00	136,437 00	197,055 00	39,408 00	2,865,616 00
San Luis Obispo	143	252 00	16,008 00	10,000 00	51,885 00	1,087,045 00
San Mateo	311	935 00	29,175 00	24,195 00	---	658,815 00

Santa Barbara	137	406 00	28,366 00	115,830 00	25,858 00	755,117 00
Santa Clara	7,357	20,300 00	111,120 00	18,436 00	73,400 00	2,934,065 00
Santa Cruz	2,064	3,045 00	47,195 00	56,646 00	90,479 00	789,671 00
Shasta	750	1,500 00	21,200 00	3,265 00	17,157 00	812,135 00
Sierra		3,950 00			3,390 00	307,310 00
Siskiyou	300	600 00				1,104,441 00
Solano	300	600 00	140,000 00	58,822 00	55,244 00	1,624,236 00
Sonoma	4,244	5,419 00	73,598 00	120,720 00		3,126,934 00
Stanislaus	1,783	4,907 00	61,625 00	77,051 00	48,589 00	1,314,752 00
Sutter			6,370 00	40,578 00		594,033 00
Tehama			29,290 00	122,151 00	3,990 00	1,014,912 00
Trinity	120	240 00	3,500 00			322,118 00
Tulare		395 00	41,276 00	98,511 00	5,580 00	971,887 00
Tuolumne			6,000 00			501,986 00
Ventura			15,673 00		380 00	528,935 00
Yolo	3,337	9,965 00	80,975 00	37,202 00		1,360,633 00
Yuba	1,340	4,275 00	100,300 00	52,515 00		1,174,815 00
Totals	102,883	\$336,198 00	\$4,249,562 00	\$8,725,809 00	\$17,374,231 00	\$112,221,720 00

SCHEDULE E.

Summary statement of the reports of the Auditors of the several counties in the year 1878.

COUNTIES.	Number of acres of land.	Value of real estate	Value of improvements on real estate.	Value of personal property, exclusive of money.	Amount of money.	Total value of all property.
Alameda	411,005	\$29,075,858 00	\$10,040,036 00	\$8,606,990 00	\$109,993 00	\$42,832,877 00
Alpine	33,341	147,949 00	136,210 00	252,980 00	3,120 00	540,259 00
Amador	164,567	939,880 00	907,990 00	612,997 00	7,775 00	2,468,642 00
Butte	491,209	7,237,887 00	1,395,191 00	2,023,602 00	66,747 00	10,743,427 00
Calaveras	217,936	825,864 00	419,700 00	607,025 00	18,815 00	1,869,404 00
Colusa	1,039,505	9,628,817 00	1,014,999 00	1,720,764 00	56,628 00	12,420,308 00
Contra Costa	449,816	5,542,167 00	838,774 00	948,720 00	15,295 00	7,344,956 00
Del Norte	50,368	239,423 00	194,966 00	249,279 00	12,382 00	696,050 00
El Dorado	226,644	938,375 00	618,945 00	707,810 00	48,160 00	2,312,590 00
Fresno	1,847,652	4,228,282 00	486,147 00	1,626,535 00	11,700 00	6,352,664 00
Humboldt	727,515	2,700,325 00	1,175,170 00	1,561,357 00	43,474 00	5,480,826 00
Inyo	66,936	377,091 00	403,792 00	656,620 00	3,794 00	1,441,297 00
Kern	1,297,060	3,840,271 00	486,396 00	1,067,626 00	31,807 00	6,026,100 00
Lake	150,767	1,074,307 00	668,073 00	414,775 00	19,434 00	2,176,589 00
Lassen	204,342	380,938 00	209,645 00	634,811 00	5,100 00	1,230,494 00
Los Angeles	1,339,089	9,831,980 00	3,872,782 00	2,541,259 00	94,330 00	16,360,351 00
Marin	319,900	5,854,286 00	1,216,870 00	1,314,543 00	27,651 00	8,413,350 00
Mariposa	181,067	556,332 00	320,995 00	401,827 00	11,944 00	1,291,098 00
Mendocino	749,475	2,909,624 00	1,124,326 00	1,895,178 00	46,835 00	5,975,963 00
Merced	980,311	3,683,382 00	498,722 00	1,097,160 00	28,981 00	5,308,245 00
Modoc	164,077	353,165 00	223,715 00	674,381 00	6,360 00	1,257,621 00
Mono	53,187	326,850 00	278,300 00	358,666 00	6,049 00	969,865 00
Monterey	789,221	5,274,339 00	742,085 00	1,144,553 00	21,868 00	7,182,845 00
Napa	338,143	4,887,105 00	1,831,285 00	1,253,761 00	44,190 00	8,016,341 00
Nevada	223,133	3,806,824 00	1,686,085 00	1,382,399 00	50,910 00	6,926,218 00
Placer	396,944	3,256,774 00	1,020,479 00	1,430,327 00	66,159 00	5,773,960 00
Plumas	189,085	1,011,205 00	535,005 00	552,112 00	16,851 00	2,115,173 00
Sacramento	616,335	7,874,832 00	6,106,140 00	4,184,835 00	251,330 00	18,417,137 00
San Benito	311,997	2,907,276 00	501,375 00	520,675 00	16,552 00	3,945,878 00
San Bernardino	441,543	1,712,618 00	443,635 00	403,785 00	16,935 00	2,576,973 00
San Diego	391,568	2,380,998 00	333,371 00	773,310 00	37,374 00	3,523,253 00
San Francisco	6,885	139,889,425 00	50,394,495 00	45,063,270 00	9,133,280 00	244,476,470 00
San Joaquin	856,807	11,691,790 00	2,810,465 00	2,713,865 00	159,009 00	17,375,129 00

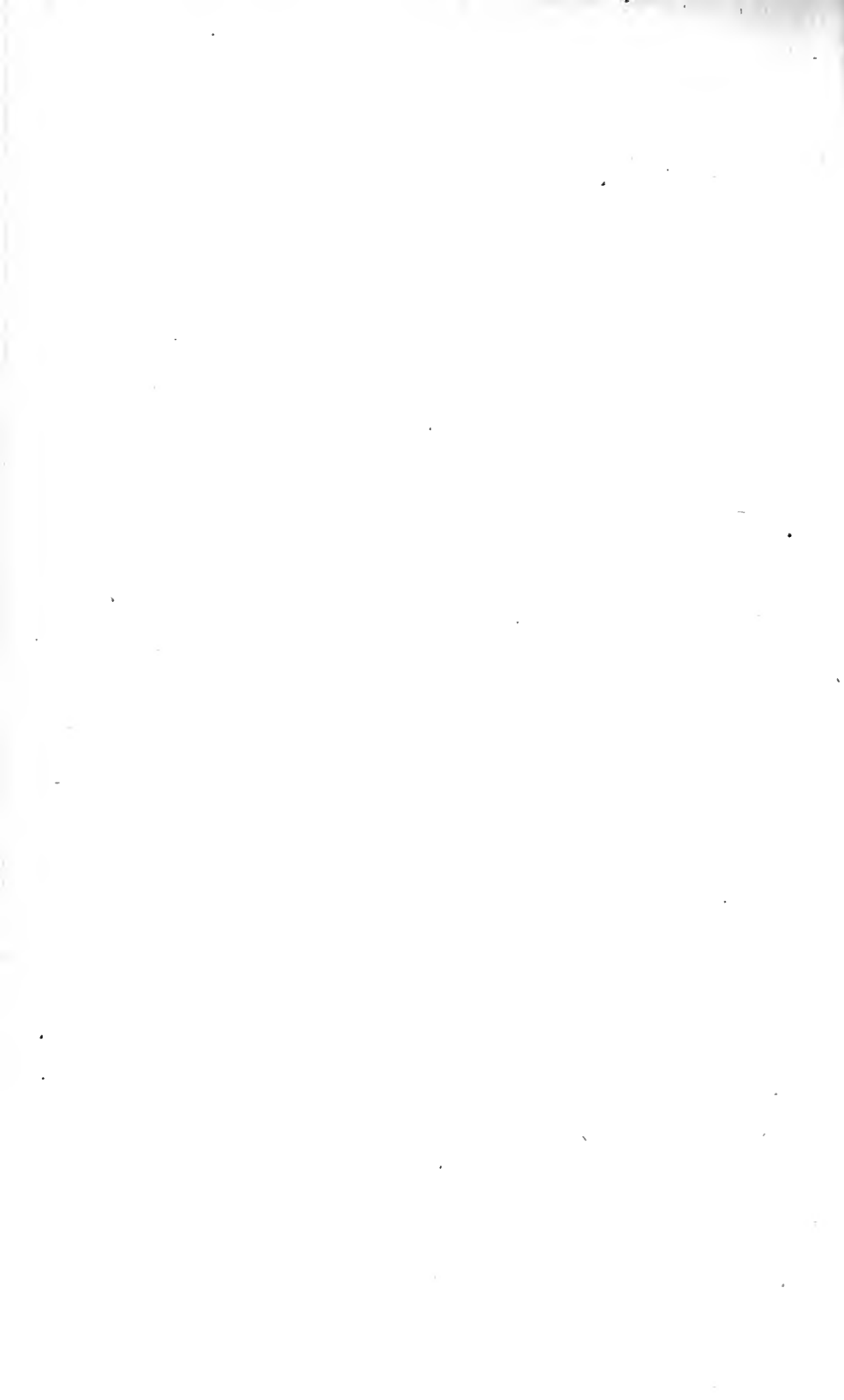
San Luis Obispo-----	987,107	2,571,266 00	643,572 00	972,458 00	23,871 00	4,411,167 00
San Mateo-----	290,427	4,777,080 00	847,820 00	725,015 00	5,810 00	6,355,725 00
Santa Barbara-----	913,415	3,647,155 00	747,921 00	903,279 00	39,283 00	5,337,638 00
Santa Clara-----	557,337	18,962,455 00	5,219,430 00	3,152,605 00	268,770 00	27,603,240 00
Santa Cruz-----	236,826	4,147,804 00	1,264,710 00	865,357 00	31,855 00	6,309,754 00
Shasta-----	123,222	482,702 00	601,494 00	841,532 00	35,708 00	1,961,436 00
Sierra-----	86,530	711,766 00	445,200 00	321,112 00	18,510 00	1,496,588 00
Siskiyou-----	198,716	1,031,232 00	471,860 00	1,090,264 00	67,011 00	2,660,367 00
Solano-----	503,288	5,874,601 00	1,536,368 00	1,608,491 00	22,069 00	9,041,329 00
Sonoma-----	718,339	9,652,799 00	3,231,601 00	2,585,967 00	109,145 00	15,579,512 00
Stanislaus-----	775,249	4,518,501 00	643,120 00	1,133,127 00	30,713 00	6,325,461 00
Sutter-----	372,206	3,007,599 00	351,425 00	743,202 00	7,950 00	4,110,176 00
Tehama-----	491,655	1,963,919 00	1,058,154 00	1,161,287 00	16,560 00	4,199,920 00
Trinity-----	63,962	348,416 00	127,493 00	307,816 00	22,005 00	805,730 00
Tulare-----	1,223,190	3,011,577 00	1,050,652 00	1,109,353 00	32,180 00	5,203,762 00
Tuolumne-----	173,878	536,845 00	543,840 00	496,065 00	19,265 00	1,506,015 00
Ventura-----	448,531	2,285,115 00	426,715 00	546,491 00	12,030 00	3,270,331 00
Yolo-----	544,264	7,290,297 00	1,352,275 00	1,467,189 00	67,666 00	10,177,427 00
Yuba-----	205,028	1,771,110 00	1,316,180 00	1,146,495 00	59,745 00	4,293,530 00
Totals-----	24,630,000	\$252,212,158 00	\$114,814,394 00	\$106,175,102 00	\$11,381,997 00	\$584,583,651 00

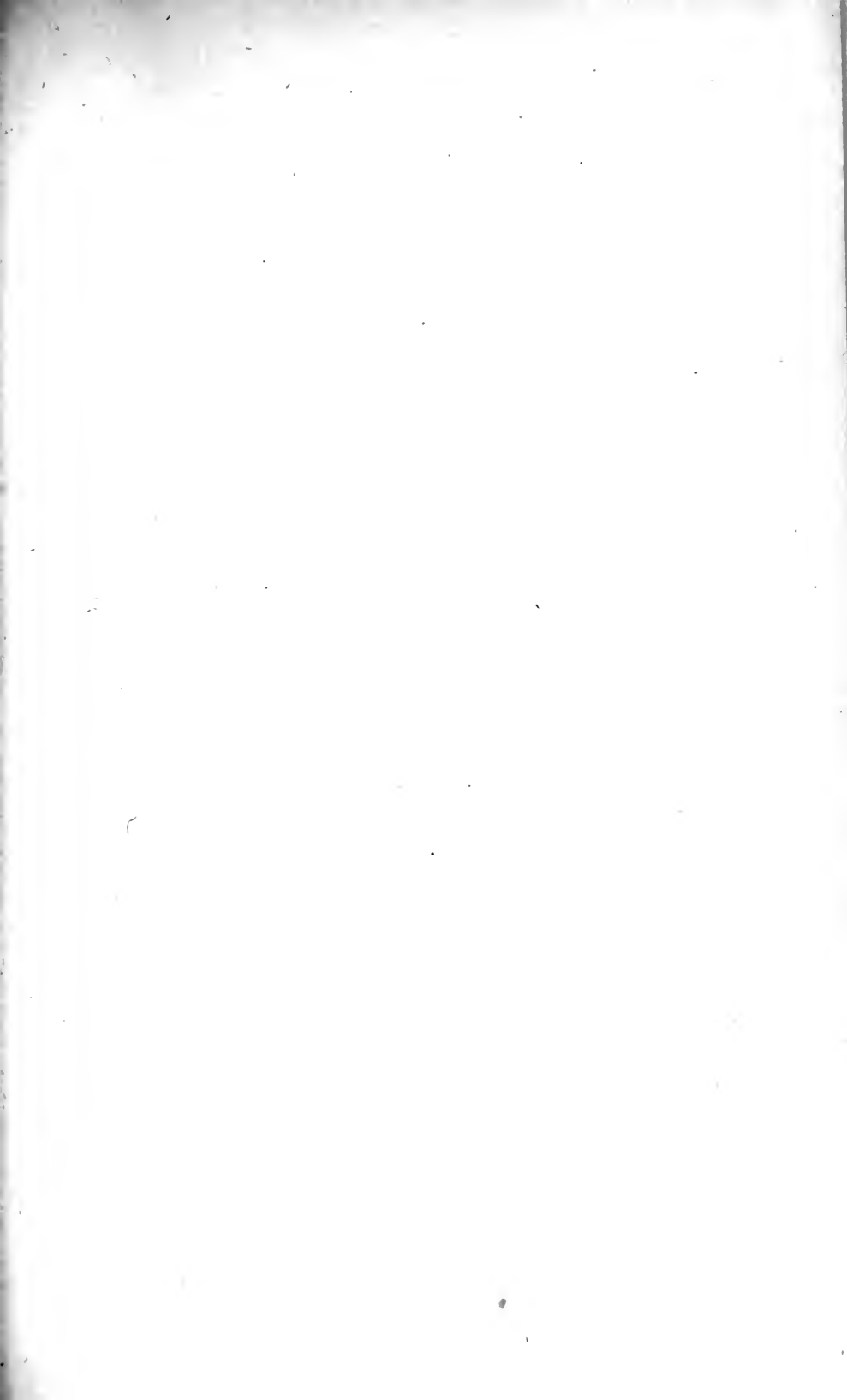
SCHEDULE E-2.

Summary statement of the reports of the Auditors of the several counties in the year 1879.

COUNTIES.	Number of acres of land.	Value of real estate.	Value of improvements on real estate.	Value of personal property, exclusive of money.	Amount of money.	Total value of all property.
Alameda	413,889	\$29,606,936 00	\$10,707,575 00	\$3,749,293 00	\$84,135 00	\$4,147,939 00
Alpine	38,502	128,931 00	118,520 00	148,027 00	118,520 00	399,033 00
Anador	167,822	925,409 00	1,001,035 00	661,369 00	2,555 00	2,600,108 00
Butte	486,245	7,135,663 00	1,339,619 00	1,742,979 00	51,510 00	10,369,771 00
Calaveras	255,717	797,924 00	461,681 00	533,643 00	12,980 00	1,806,228 00
Colusa	1,052,773	9,918,589 00	1,067,928 00	1,530,891 00	40,869 00	12,558,277 00
Contra Costa	448,866	5,876,844 00	839,390 00	930,115 00	24,896 00	7,711,245 00
Del Norte	51,673	231,447 00	202,074 00	227,066 00	8,624 00	669,801 00
El Dorado	173,504	925,520 00	639,200 00	706,665 00	51,740 00	2,323,125 00
Fresno	1,631,972	4,077,647 00	474,780 00	1,461,714 00	15,819 00	6,029,960 00
Humboldt	754,799	2,696,931 00	1,196,630 00	1,444,099 00	70,072 00	5,407,732 00
Inyo	60,489	263,395 00	349,319 00	462,866 00	2,150 00	1,078,336 00
Kern	741,885	2,369,982 00	440,922 00	953,710 00	12,626 00	3,777,240 00
Lake	151,990	1,031,401 00	537,462 00	513,466 00	17,161 00	2,119,490 00
Lassen	155,820	389,770 00	220,523 00	587,721 00	14,748 00	1,212,762 00
Los Angeles	1,221,625	10,941,898 00	2,654,895 00	2,440,176 00	106,808 00	16,143,777 00
Marin	318,367	5,465,582 00	1,217,560 00	1,163,452 00	17,300 00	7,863,894 00
Mariposa	192,224	560,449 00	320,826 00	398,007 00	14,475 00	1,293,757 00
Mendocino	753,339	2,802,336 00	1,098,397 00	1,639,751 00	25,366 00	5,585,850 00
Merced	1,015,805	3,785,318 00	547,545 00	1,354,523 00	35,174 00	5,722,560 00
Modoc	162,418	369,694 00	250,812 00	698,698 00	6,386 00	1,325,590 00
Mono	66,773	571,750 00	555,425 00	532,799 00	31,803 00	1,691,779 00
Monterey	751,420	5,101,169 00	741,290 00	1,215,043 00	18,756 00	7,076,258 00
Napa	338,078	4,397,670 00	2,069,920 00	1,239,498 00	38,048 00	7,965,136 00
Nevada	202,684	3,797,627 00	1,661,490 00	1,271,964 00	45,475 00	6,776,536 00
Placer	320,923	3,257,591 00	1,056,727 00	1,275,985 00	52,629 00	5,642,932 00
Plumas	186,497	887,633 00	511,505 00	508,965 00	12,146 00	1,920,249 00
Sacramento	610,466	7,745,195 00	6,138,230 00	3,976,615 00	704,075 00	18,564,115 00
San Benito	312,550	2,635,246 00	407,095 00	538,678 00	12,928 00	3,673,947 00
San Bernardino	460,900	1,708,373 00	430,443 00	434,215 00	13,910 00	2,586,221 00
San Diego	1,277,334	1,916,225 00	320,808 00	574,968 00	35,169 00	2,847,170 00
San Francisco	6,862	123,113,060 00	43,314,940 00	43,570,856 00	7,388,635 00	217,867,491 00
San Joaquin	863,720	12,659,960 00	3,147,738 00	2,755,327 00	113,974 00	18,677,019 00

San Luis Obispo	1,011,285	2,537,694	580,803	990,275	6,062	4,114,834
San Mateo	296,059	4,686,565	823,880	655,517	1,500	6,167,262
Santa Barbara	358,063	2,307,267	583,940	803,660	28,522	3,725,389
Santa Clara	560,142	16,502,660	4,949,130	2,948,915	203,420	24,604,125
Santa Cruz	237,080	3,703,664	1,124,626	744,487	47,372	5,620,149
Shasta	112,987	510,388	657,984	773,602	40,428	1,982,402
Sierra	84,259	697,340	390,750	328,190	16,165	1,432,445
Siskiyou	204,771	960,225	544,509	1,090,515	66,963	2,662,212
Solano	503,267	5,581,991	1,371,584	1,605,966	28,385	8,587,926
Sonoma	727,919	9,301,276	3,222,874	2,443,786	120,276	13,089,212
Stanislaus	834,766	4,138,483	656,880	1,322,624	28,763	6,146,750
Sutter	371,158	2,876,936	428,350	592,686	750	3,898,722
Tehama	840,781	2,443,629	1,024,870	907,632	20,540	4,395,771
Trinity	73,880	395,691	180,801	298,568	23,550	898,610
Tulare	1,073,250	2,787,644	999,234	908,277	22,261	4,717,416
Tuolumne	178,440	578,500	559,025	503,767	20,919	1,664,211
Ventura	647,701	1,991,925	387,165	501,908	13,291	2,894,289
Yolo	547,148	7,160,654	1,351,575	1,333,168	26,350	9,871,747
Yuba	213,110	1,737,645	1,341,995	1,118,165	56,150	4,263,955
Totals	24,534,057	\$329,213,192	\$107,344,299	\$101,198,292	\$9,866,986	\$547,622,769





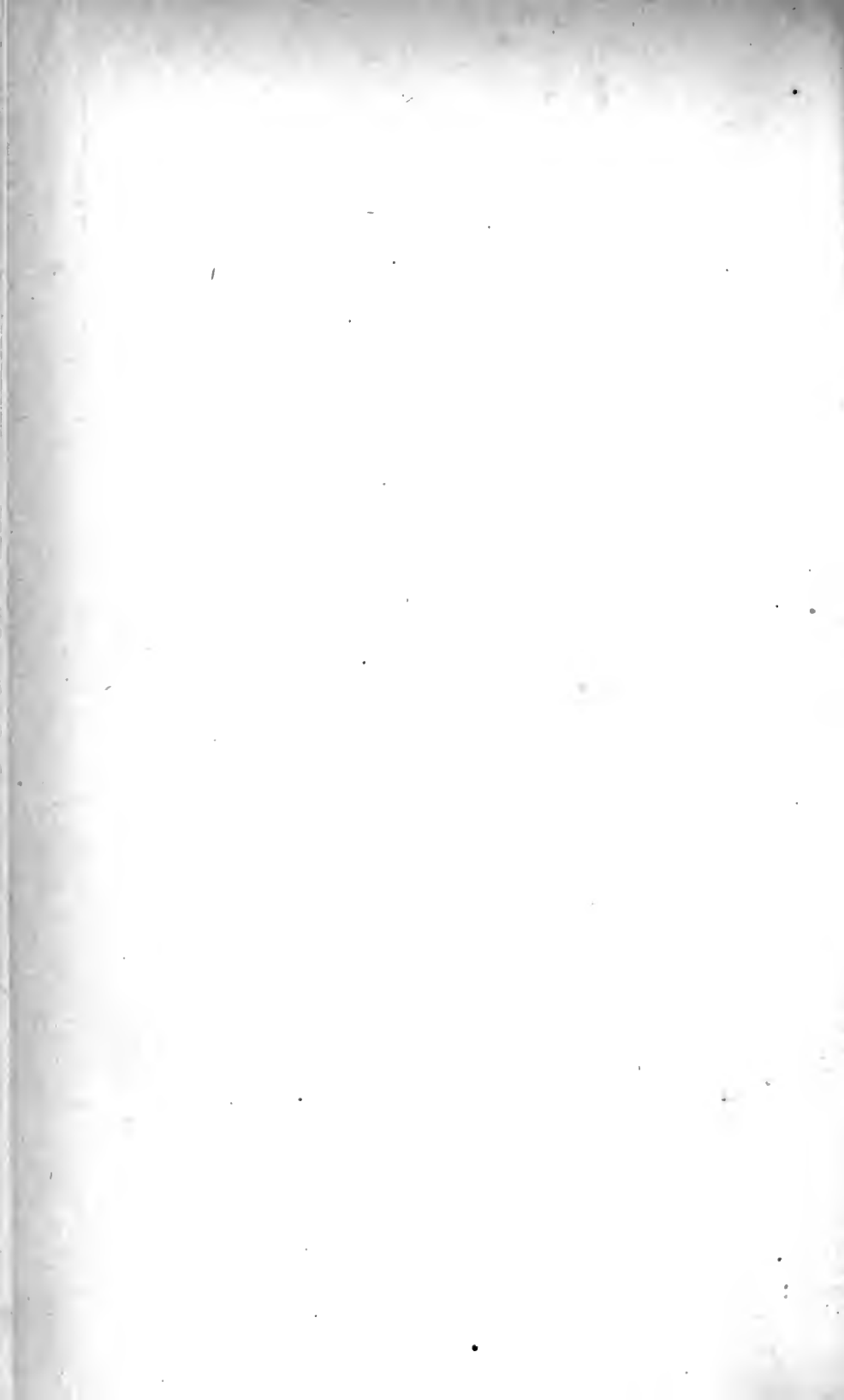
BIENNIAL REPORT

OF THE

COMMISSIONERS TO MANAGE THE YOSEMITE VALLEY

AND THE

MARIPOSA BIG TREE GROVE.



REPORT.

SAN FRANCISCO, December 17th, 1879.

To His Excellency, William Irwin, Governor of California :

SIR: In accordance with law, the Commissioners to Manage the Yosemite Valley and the Mariposa Big Tree Grove have the honor to submit the following as their biennial report:

At the last session of the Legislature the sum of \$10,000 was appropriated, to be expended in the Yosemite Valley, as well as on a road through the Mariposa Big Tree Grove, and the Act making the appropriation prescribed the manner in which it should be expended, which was as follows:

For bridges in the Yosemite Valley.....	\$6,000 00
For road in the Big Tree Grove.....	1,000 00
For payment of claim of A. Lancy and W. C. Holmes.....	777 00
For preservation and improvement of the Yosemite Valley.....	2,223 00
Total	\$10,000 00

Of the above sum the Commissioners have already drawn and expended all but \$2,223, and it is thought the whole appropriation will be exhausted before the expiration of the present fiscal year.

The claim of Messrs. Lancy and Holmes was paid in advance by the Commissioners, out of funds they had derived from rents in the Valley, immediately upon the passage of the Act making the appropriation. This claim was for carpenter work done upon one of the buildings used as a hotel in the Yosemite, and which had been ordered built without the consent and against the wishes of the Commissioners, by Messrs. Coulter and Murphy, lessees of the premises. These parties failed in business, and being unable to pay their debts or their rent the Legislature generously appropriated a sum sufficient to pay Messrs. Lancy and Holmes for the work done by them.

Soon as possible after the adjournment of the Legislature, the Commissioners sent Mr. Charles H. Gorrill, an experienced bridge builder, into the Yosemite to examine as to the best location for two or three bridges across the Merced, the cost of erecting the same, and the most desirable style to adopt. Mr. Gorrill reported in favor of two substantial bridges, one on the site of the old one at the upper hotel, with a span of ninety feet, and the other with a span of eighty feet, at or near the site of the old Folsom bridge, or else some distance lower down the river, above the "Bridal Veil Meadow," where it would accommodate the travel coming in from the south side of the Valley, as well as give a crossing further down, and enable tourists to

make the circuit in carriages, as well as on horseback, without being obliged to ford the river.

In coming to a final determination as to which of the last two sites would be the most desirable, the Commissioners consider themselves very fortunate in having been able to secure the distinguished services of Colonel George E. Gray, Chief Engineer of the Southern Pacific Railroad, who was in the Valley while the Board was in consultation, and, on being requested to do so, cheerfully gave the benefit of his advice and great experience. This resulted in the Commissioners deciding to cross the river with the lower bridge just above the rapids, and where there is considerably greater elevation to the banks than elsewhere. The question of the best style of bridge to adopt was one which gave the Commissioners a good deal of anxiety. Nearly all those parties whom they consulted with regard to the duration or life of a wooden bridge in the mountains, where the travel was not great in the winter, and where the fall of snow is heavy, gave it as their opinion that if made of timber, covered bridges were most desirable, for if unprotected, the weight of snow and ice, and its slow melting in the spring, would inevitably induce early decay and consequent rapid destruction of any wooden structure. The Commissioners were very unwilling to have such unsightly objects as covered bridges in the Yosemite, particularly when they ascertained that the cost of each bridge would be nearly \$3,000, or one-half of the appropriation. In this emergency the Pacific Bridge Company, of San Francisco came to their rescue, and offered to construct two iron bridges, according to specifications, for the sum of \$6,000. This proposition the Commissioners accepted, and the bridges were erected in the autumn of 1878, the company guaranteeing them for three years against any defects of material used, or faults of construction or design. These bridges have met with general approval, and the Commissioners consider themselves very fortunate in having been able to expend the sum appropriated to such good advantage.

In the spring of 1879, the Commissioners decided to make efforts to improve the fish in the streams leading into the Yosemite, and with this object in view entered into communication with the Fish Commissioners. These gentlemen promptly accorded all that they asked for, and in March last gave the services of one of their employes, who was dispatched with 15,000 Eastern and McCloud River trout, 5,000 of which were to be left in Big Creek, one of the tributaries of the Merced, and the remainder were for the streams in the Yosemite. Unfortunately, however, in passing through Mariposa, the water had to be changed, which proved disastrous, and many of the fish died, so that by the time they reached the Valley it is probable no more than 4,000 or 5,000 were alive, and it will be a year yet before it can be known whether the experiment will be at all successful. As it is so very desirable to have the streams stocked with good fish, it is the intention of the Commissioners, if they have the necessary funds at their command, to establish a hatching house in the Valley, and thus remove all chances of failure in the future.

In the spring of 1878, the Commissioners received an application from the Rev. J. K. McLean and others, representing an association known as the Sunday School Union, for permission to erect in the Yosemite Valley a chapel, which should be used for undenominational purposes. The Commissioners granted this application, and

a handsome, tasteful building was completed in time for the famous Sunday School Celebration which took place last June.

On the first of July, 1879, the Commissioners purchased from Mr. W. J. Howard the privilege of collecting toll on the road leading to Mirror Lake, for the sum of \$600, and made it free from that date, so that now all the roads on the level of the Yosemite Valley and within the limits of the grant, are free to tourists and others. The trails leading out of the Valley to the various points of interest are, however, still burthened with toll, and the Commissioners do not see how this can be avoided until such time as the Legislature sees fit to make an annual appropriation sufficient to keep them in repair.

In 1878, the Commissioners ordered a survey for a line of road through the Big Tree Grove, and found that it would be about four (4) miles long. They advertised in August of that year for bids for its construction, and the lowest and only bid they received was at the rate of \$450 per mile. This bid they rejected and afterwards made an arrangement with Mr. A. H. Washburn, who was then constructing a road in the immediate neighborhood for the Yosemite Stage Company, to build this road for them at its actual cost. The Commissioners have already paid for this work and the survey \$1,090, and some more is yet due upon it—how much they cannot say as they have been unable to obtain the full amount from Mr. Washburn, but understand it is only a small amount.

In way of general improvements the Commissioners, during the past season, have turned the Merced River back into the old channel, above the Sentinel Bridge, by clearing it of obstructions and constructing a dam where it was washing away the bank. This was necessary to prevent it cutting a new course for itself through the low land north of where it now flows. They have also had the rocks blasted above the rapids at the "Bridal Veil Bridge," so as to lower the stream and relieve it at this point. Next season, if they have the requisite funds, the Commissioners contemplate introducing into the Valley water, through pipes from the Sentinel Creek, for household and irrigating purposes. They consider this a most necessary work to be accomplished at as early a date as possible from a sanitary point of view if from no other.

At the date of the last biennial report the Commissioners had received from rents an aggregate of \$5,457 50. During the past two years they have received the further sum of \$6,385 00, distributed as follows:

Rents of 1877 not paid until 1878	\$1,000 00
Rents of 1878	2,735 00
Rents of 1879	2,650 00
Total	\$6,385 00

The only change that has taken place in the Board during the past two years is the appointment of Mr. Wm. C. Priest, of Big Oak Flat, Tuolumne County, as Commissioner, in place of Prof. J. D. Whitney, who is no longer a resident of the State.

Respectfully submitted, by order of the Board of Commissioners to Manage the Yosemite Valley and the Mariposa Big Tree Grove.

WM. ASHBURNER, Secretary.

STATEMENT OF RECEIPTS AND EXPENDITURES.

Statement of receipts and expenditures of the Board of Commissioners to Manage the Yosemite Valley and the Mariposa Big Tree Grove, from November 12th, 1877, to December 17th, 1879.

RECEIPTS.

Balance from last report, November 12th, 1877	\$1,449 07
Received from rents	6,385 00
Received from Controller's warrants	7,777 00
Total	<u>\$15,611 07</u>

EXPENDITURES.

Disbursed on account of Guardian's salary to December 31st, 1879	\$1,673 94
Disbursed on account of traveling expenses	962 80
Disbursed on account of improvements in the Yosemite Valley	2,492 58
Disbursed on account of sundries (office rent, office furniture, stationery, advertising, postage, discount on silver, etc.)	600 19
Disbursed on account of printing	25 00
Disbursed on account of legal expenses	98 00
Disbursed on account of new bridges and road	6,175 00
Disbursed on account of Mariposa Big Tree Grove road	1,090 00
Paid A. Lancy and W. C. Holmes	777 00
Balance cash on hand	1,716 56
Total	<u>\$15,611 07</u>

WM. ASHBURNER, Secretary.

SAN FRANCISCO, December 17th, 1879.





BIENNIAL REPORT

OF THE

SUPERINTENDENT OF STATE PRINTING

TO THE

LEGISLATURE OF THE STATE OF CALIFORNIA.

TWENTY-THIRD SESSION—1878-9.



SUPERINTENDENT'S REPORT—1878.

OFFICE OF SUPERINTENDENT STATE PRINTING, }
SACRAMENTO, CAL., August 20th, 1878. }

To His Excellency, William Irwin, Governor of California :

SIR: In accordance with law, I have the honor to make the following report of the transactions of the Department of State Printing. My last biennial report covered the operations of the Department up to and including the first five months of the 29th fiscal year, from July 1st, 1877, to December 1st, 1877.

The annexed table is an itemized statement of expenditures from December 1st, 1877, to June 30th, 1878:

TABLE I.

Expenditures from December 1st, 1877, to June 30th, 1878—29th fiscal year.

Employés	\$19,936 44
Paper, envelopes, etc.....	12,431 18
Binding, folding, and stitching	7,518 80
Type	1,705 84
Lithographing and engraving	1,045 75
Ink	550 00
Gas	515 25
Drayage	342 50
Repairing	410 84
Oil, etc.....	219 02
Postage, etc.....	225 18
Boarding horse	185 00
Water	135 00
Furniture	80 25
Merchandise	73 48
Expressage	38 05
Varnishes	37 10
Rags	24 00
Washing towels.....	12 75
Horse blanket.....	5 50
Total	\$45,491 93

Table II shows the cost of work done for the various departments, and permanent property acquired. For table of stock received, consumed, and on hand, see appendix to report.

TABLE II.

Department Printing for the 29th fiscal year ending June 30th, 1878.

Senate	\$14,865 51
Assembly	11,585 49
Executive Department	619 98
Secretary of State	632 39
State Controller	264 68
State Treasurer	220 16
Superintendent Public Instruction	6,118 10
Surveyor-General	98 62
Attorney-General	208 29
Supreme Court	2,474 56
Adjutant-General	1,209 52
State Librarian	229 21
Superintendent State Printing	190 53
State Board of Equalization	126 45
Commissioner of Transportation	1,671 00
State Normal School	434 01
State Board of Health	400 49
State Board of Examiners	31 58
State Harbor Commissioners	402 83
State Prison Directors	344 18
Pilot Commissioners	65 17
University of California	929 61
State Land Commission	218 63
West Side Irrigation Commission	50 25
Commissioners of Yosemite and Big Tree Grove	5 00
Deaf and Dumb, and the Blind Institution	54 33
Stockton Insane Asylum	8 61
Bank Commissioners	122 65
State Engineer	204 26
Total	<hr/> \$43,786 09
Permanent property (printing material, etc.)	1,705 84
Total	<hr/> \$45,591 93

Respectfully submitted,

F. P. THOMPSON,
Supt. State Printing.

SUPERINTENDENT'S REPORT—1879.

OFFICE OF SUPERINTENDENT STATE PRINTING, }
SACRAMENTO, CAL., August 25th, 1879. }

To His Excellency, William Irwin, Governor of California:

SIR: In accordance with law, I have the honor to submit my report of the transactions of the Department of State Printing for the 30th fiscal year, to wit, from July 1st, 1878, to June 30th, 1879.

The following is an itemized statement of expenditures:

TABLE A.

Expenditures 30th fiscal year, from July 1st, 1878, to June 30th, 1879.

Employés	\$14,926 85
Paper, envelopes, etc.	13,284 15
Binding, folding, and stitching	15,854 09
Type	789 06
Lithographing and engraving	883 28
Ink	757 50
Fuel	986 00
Gas	255 70
Drayage	258 00
Repairing	179 16
Merchandise	829 67
Boarding horse	150 00
Plumbing	137 62
Indexing laws	450 00
Contingent expenses	100 57
Telephone	160 00
Water	90 00
Water-closet vault	77 50
Labor	97 00
Paper-case	37 00
American District Telegraph Company	23 75
Horse-shoeing	15 50
Expressage	45 50
Ice	31 88
Harness	50 00
Washing towels	24 00
Rags	10 00
Rubber valves	6 25
Total	\$50,510 03

Table B is an itemized statement of expenditures, creating a deficiency to be provided for by an additional appropriation.

TABLE B.

Itemized statement of deficiency for 30th fiscal year, ending June 30th, 1879.

Employés	\$13,436 55
Binding, folding, and stitching	5,776 96
Paper, etc.	4,863 20
Permanent property	3,505 22
Ink	562 50
Gas	219 60
Drayage	246 00
Repairing	162 20
Postage, expressage, etc.	902 10
Boarding horse	150 00
Water	90 00
Wood	986 00
Sundries	204 92
Rent of fire alarm and telephone	15 00
Rags	24 00
Total	\$31,144 25

Table C shows the cost of department printing in detail for the 30th fiscal year.

TABLE C.

Department printing for 30th fiscal year, from July 1st, 1878, to June 30th, 1879.

Statutes, 1877-8	\$6,519 60
Amendments to Codes, 1877-8	2,568 52
Statutes, 1877-8 (Spanish)	4,629 73
Amendments to Codes, 1877-8 (Spanish)	727 50
Senate Journal, 1877-8	2,311 04
Assembly Journal, 1877-8	3,081 40
Indexing Statutes and Journals	450 00
Appendices to Journals, volumes 1, 2, 3, 4	1,298 17
Chinese Immigration Reports	1,642 57
Executive Department	258 65
Secretary of State	525 11
State Controller	344 45
State Treasurer	118 85
Superintendent Public Instruction	6,531 97
Surveyor-General	336 05
Attorney-General	545 39
Supreme Court	2,281 62
Adjutant-General	446 86
State Librarian	260 83
Superintendent State Printing	346 73
Board of Equalization	109 19
Transportation Commissioners	1,164 97
State Normal School	509 56
State Board of Health	189 28
State Board of Examiners	76 65
State Capitol Commissioners	35 00
State Prison Directors	574 83
Insurance Commissioner	766 69
State Agricultural Society	6,058 38
Pilot Commissioners	25 75
University of California	1,227 09
Commissioners Yosemite and Big Tree Grove	6 50
Deaf and Dumb, and the Blind Institution	80 98
Stockton Insane Asylum	35 99
Napa Insane Asylum	362 78
Bank Commissioners	258 25
State Engineer	206 33
Total	\$46,913 26

Table D shows the work done for the Constitutional Convention, and the character of the same:

TABLE D.

Cost of printing for Constitutional Convention.

Amendments, memorials, and resolutions	\$2,885 65
Journal	983 78
Reports	457 97
Job work—roll-calls, files, etc.	445 68
Constitutions, printed and mailed	10,627 15
Election tickets (paper furnished by Secretary of State)	1,774 30
Binding, folding, and stitching for Convention	5,587 34
Total	\$22,761 87

We now append Table E, a balance sheet, showing expenditures, appropriations, department printing, and property acquired and on hand:

TABLE E.

DEBIT.	
Department printing	\$46,913 26
Constitutional Convention printing (less \$2,438 05, total paid out of Convention Fund)	20,323 82
Permanent property acquired (printing material, etc.)	4,568 79
Paper stock on hand	9,338 38
Total	\$81,144 25
CREDIT.	
By appropriation	\$50,000 00
By deficiency	31,144 25
Total	\$81,144 25

RECOMMENDATIONS HERETOFORE MADE AND ADVANTAGES ATTAINED BY THEIR ADOPTION.

The State Printing law, as originally enacted, made no provision for the manner of keeping the accounts relative to work done and the cost of the same. It devolved upon myself, as the first Superintendent of State Printing, after the commencement of operations under the new law, to organize the work and adopt such a system of keeping the books as to protect the interests of the State and secure an economical administration of the affairs of the office. To secure this end I prepared the following amendments, and placed them in the hands of the Judiciary Committee of the Senate, by whom they were duly submitted to the Legislature, and enacted as a part of Section 526 of the Political Code:

Four—He shall keep in his office, open to public inspection, a time-book, containing the name of every employé connected with the State Printing Office, the time employed, the rate of wages, and amount paid; and he shall certify, under oath, to the correctness of all claims for services rendered and materials furnished, which certificate shall be attached to and presented with each claim that shall be presented to the Board of Examiners for allowance, and no such claim shall be certified or allowed unless it be fully itemized.

Five—He shall file in the office of the Secretary of State all proposals, bids, contracts, bonds, and other papers appertaining to the awarding of contracts now in his possession, or which may hereafter come into his possession, retaining in his office copies of the same; and the Secretary of State shall promptly furnish the Board of Examiners, for their use, certified copies of all such papers.

Six—All printing required by any of the State Departments, Boards, or any State officer, for the State, the order for the same shall be made out upon a printed blank, with voucher attached, to be furnished by the Superintendent of State Printing, and forwarded to the office of said Superintendent, who shall enter, upon a book kept in his office for that purpose, a transcript of said orders; and shall return with the work, when completed, to the person ordering the same, the original order, with duplicate voucher attached; said voucher to be signed by the person receiving the work, and returned to the Superintendent of State Printing, and both original and duplicate orders shall be kept on file in his office, and shall be a sufficient voucher for said work. The Superintendent of State Printing shall enter, upon a book to be kept for said purpose, the name, quantity, and weight of paper used for each order printed. He shall also certify, under oath, that all materials, stock, and paper furnished the office under contracts are of the quality, kind, and weight required by such contracts; and no claim arising under any contract shall be allowed or paid unless accompanied by such certificate. He shall also retain and file in his office one copy or sample of each blank, circular, pamphlet, book, legislative bill, file, or report, or any other work emanating from the State Printing Office, excepting blank books, of which he shall file only sample sheets. Said copies or samples shall bear a uniform number and date with the voucher.

Subdivisions seven and eight were proposed so as to limit the extravagant ordering of printing by attachés of the Legislature, by fixing some central authority for the issuing of orders, and giving of receipts for work done, and placing the responsibility of the proper distribution of printed matter, ordered by the Legislature, upon the respective Sergeants-at-Arms of the Senate and Assembly, who are amenable to those bodies, the protection of the Superintendent of State Printing being the receipt of the Sergeant-at-Arms of the body ordering the printing:

Seven—No printing for the Senate, or any committee of the same, shall be executed except upon an official order of the Secretary, and no order for any printing shall be made by that officer unless the same is ordered by a majority vote of the Senate. All printing done for the Senate shall be delivered to the Sergeant-at-Arms of that body, whose duty it shall be to distribute one-third of the copies of any document printed to the members of the Senate, and two-thirds to the Sergeant-at-Arms of the Assembly, who shall receipt therefor, for distribution to the members thereof. There shall be printed 240 copies of all bills, resolutions, and reports ordered printed by the Senate.

Eight—No printing for the Assembly, or any committee of the same, shall be executed except upon an official order of the Chief Clerk, and no order for any printing shall be made by that officer unless the same is ordered by a majority vote of the Assembly. All printing done for the Assembly shall be delivered to the Sergeant-at-Arms of that body, whose duty it shall be to distribute two-thirds of the copies of any document printed to the members of the Assembly, and one-third to the Sergeant-at-Arms of the Senate, who shall receipt therefor, for distribution to the members thereof. There shall be printed 240 copies of all bills, resolutions, and reports ordered printed by the Assembly.

Nine—The receipts of the respective Sergeant-at-Arms of the Senate and Assembly shall be a sufficient voucher to the Superintendent of State Printing for all work done for either House. (Amendment, approved April 1, 1878).

PRINTING STATUTES.

The importance of having the newly enacted laws issued at the earliest possible time, induced me to make the following suggestions to the Legislature, in my first biennial report to that body:

In this connection, I would suggest that each law might be printed as soon as it is passed, a proof-sheet furnished to the Committee on Enrollment, and by them compared, and if found correct, one copy be printed on parchment paper, signed by the proper officers, and the printed copy transmitted to the Governor, instead of an enrolled copy, and, if signed by him, become the record to be transmitted to the Secretary of State for file. There are several important ends accomplished by the above suggestion:

First—It would save the entire cost of enrolling bills—which forms a very large item in the contingent expenses of the respective Houses—which at the last session of the Legislature reached the amount of \$6,161 70.

Second—A printed law can never be changed without detection—a written one can.

Third—It would bring the record into a more compact and durable shape, greatly facilitating reference to the same when necessary.

Fourth—When this printed bill was signed by the Governor and became law, the requisite

sheets could be printed to form the edition of the statutes, thereby saving the cost of recopying the laws from the enrolled bills, by the Secretary of State, for the printer.

Should this plan be adopted, the statutes would be ready for distribution within thirty days after the adjournment of the Legislature. Two hundred and forty copies of each law might be printed for distribution to the members of both Houses, the only additional cost being paper and press-work, as the one composition would answer for all the editions.

In accordance with the foregoing, the following amendment was prepared and incorporated by law as a part of the Political Code:

Whenever any bill, joint or concurrent resolution, is passed to enrollment, by either the Senate or Assembly, the Committee on Enrollment of the House in which the bill, joint or concurrent resolution originated, shall transmit the same, without delay, to the Superintendent of State Printing, who shall receipt for all such bills and resolutions, and proceed at once to have the same printed, in the order in which received, in the measure prescribed by law for the statutes. So soon as printed, one copy, with proper blanks for the signatures of the officers whose duty it is to sign enrolled bills, shall be printed on bond paper, which, together with the engrossed bill, shall be sent to the Committee on Enrollment of the House in which the bill originated. Said committee shall compare such copy with the engrossed bill, and if it is found to be correct shall present it to the proper officers for their signatures. When such officials shall have signed their names thereon, as required by law, it shall be an enrolled bill, and shall be transmitted to the Governor for his approval. If the same is signed by the Governor, and becomes a law, the printed law shall go to the Secretary of State and become the official record.

Second—Whenever a law is signed by the Governor, official notice shall be forwarded, in writing, to the Superintendent of State Printing of the fact. Upon the receipt of said official notice, the Superintendent of State Printing shall cause to be printed, for the use of the Legislature, 240 copies of said law, joint or concurrent resolution, to be distributed, one-third to the Senate and two-thirds to the Assembly, the Sergeant-at-Arms of the respective Houses to receipt to the Superintendent of State Printing for the same, whose receipt shall be a proper voucher for the work. He shall also cause to be printed the requisite number of sheets to make the number of copies of the statutes required by law to be printed, the one composition of type to answer the purpose of printing the three editions; and of such laws, resolutions, and memorials as may be designated by the Legislature, 240 copies in Spanish. Of the Journals and Appendices of the Senate and Assembly there must be printed 480 copies, in one volume or more, as may be required by the size thereof. The Superintendent of State Printing shall have the laws, Journals of Senate and Assembly, and the Appendices thereto, properly indexed and bound, the laws in full law sheep binding, and Journals and Appendices in half law sheep binding, marble sides, and deliver the same to the Secretary of State for distribution as soon as practicable after the final adjournment of the Legislature, and the receipt of the Secretary of State shall be his voucher therefor. (Amendment, approved April 1, 1878.)

To carry out the provisions of the above law, it will be necessary to purchase an additional book press at a cost of \$4,500, and type to the value of \$2,500; which amount does not exceed the sum it would be necessary to pay for the enrollment of bills during one session of the Legislature, by Enrolling Clerks, if this amendment had not been adopted, as shown by the Controller's books in account with previous Legislatures, to say nothing of the convenience and importance of having the statutes printed and distributed to the Legislature while in session, and to the public as soon as enacted, instead of three or four months thereafter, as was necessarily the case under the old law.

COMPARATIVE TABLE.

I now invite inspection of the following comparative table of the cost of the work executed, from December 1st, 1875, to June 30th, 1879, and the amount it would have been necessary to pay for the same had the old system remained in force. The estimates for the old system are made up from the rates allowed State Printers, under

the law relative to public printing, up to the time of the establishment of the State Printing Office:

DEPARTMENTS.	Present System.	Old System.
Senate	\$26,202 10	\$37,993 04
Assembly	22,137 05	32,098 72
Statutes	12,900 03	16,125 00
Amendments to Codes	5,178 68	6,473 35
Statutes (Spanish)	8,893 64	10,939 16
Amendments to Codes (Spanish)	1,378 83	1,765 90
Senate Journals	5,028 16	6,655 42
Assembly Journals	5,350 88	7,107 23
Appendices to Journals	5,959 42	7,228 84
Executive Department	2,151 94	3,078 66
Secretary of State	2,753 00	4,665 08
State Controller	2,427 27	3,261 71
State Treasurer	980 85	1,283 79
Superintendent of Public Instruction	19,424 21	26,196 79
Surveyor-General	2,605 18	3,473 81
Attorney-General	1,412 00	1,923 58
Supreme Court	9,154 81	11,691 63
Adjutant-General	3,734 06	4,895 10
State Librarian	1,147 61	1,581 25
Superintendent of State Printing	960 55	-----
Board of Equalization	1,250 04	1,660 45
Transportation Commission	9,989 34	14,063 09
State Normal School	1,806 66	2,452 92
State Board of Health	1,655 80	2,619 65
State Board of Examiners	164 20	287 35
State Capitol Commissioners	54 40	76 16
State Harbor Commissioners	550 00	696 51
State Prison Directors	2,179 20	3,272 26
Insurance Commissioner	2,527 55	3,574 84
State Agricultural Society	9,023 94	11,591 61
Pilot Commissioners	126 36	176 90
University of California	4,166 58	5,785 28
State Land Commission	392 23	549 12
Senate Chinese Investigating Committee and Reports	5,648 30	7,804 65
West Side Irrigation Commissioners	632 75	885 85
Commissioners of Yosemite and Mariposa Big Tree Grove	113 41	164 44
Deaf and Dumb, and the Blind Institution	285 41	413 50
Stockton Insane Asylum	362 39	507 23
Napa Insane Asylum	695 29	991 28
Fish Commissioners	174 61	253 18
Bank Commissioners	380 90	496 26
State Engineer	410 59	575 07
Constitutional Convention	22,761 87	31,866 61
Total	\$205,133 09	\$279,202 27
Indexing Statutes and Journals—1877-8	450 00	450 00
	\$205,583 09	\$279,652 27

RECAPITULATION

From December 1st, 1875, to June 30th, 1879.

DEBIT.

Appropriation for the support of the State Printing Office-----	\$191,000 00
Salary of Superintendent of State Printing-----	8,600 00
Deficiency -----	31,144 25
Total debit -----	<u>\$230,744 25</u>

CREDIT.

Total department printing-----	\$205,133 09
Salary Superintendent of State Printing-----	8,600 00
Indexing Statutes-----	450 00
Permanent property-----	7,222 78
Paper stock on hand-----	9,338 38
Total credit -----	<u>\$230,744 25</u>

Estimated difference between cost of printing under the old and new systems, from December 1st, 1875, to June 30th, 1879.

Estimated cost of department printing under the old system-----	\$279,652 27
Actual cost of department printing under the present system-----	\$205,583 09
Salary of Superintendent of State Printing-----	8,600 00
	<u>214,183 09</u>
Difference in cost-----	\$65,469 18
To which should be added permanent property acquired, and paper stock on hand--	16,561 16
Total actual saving to the State-----	<u>\$82,030 34</u>

SAVING MADE BY THE PRESENT SYSTEM.

Another item to which I will call your attention is the amount formerly paid to Copying Clerks of the Legislature. When I entered upon my duties as Superintendent of State Printing, I suggested to the Legislature then in session that the necessity of Copying Clerks no longer existed, as the Superintendent could receipt for and print all bills from the engrossed copy, and at the same time be able to get the printed matter before the Legislature in one-half the time it could be done if each bill had to be copied before being printed. Acting upon the suggestion, the office of Copying Clerk was declared abolished by resolution, as will be seen by reference to Journals of twenty-first session, thereby making a further saving to the State, during the last two sessions of the Legislature, of \$13,420, which sum it would have been necessary to pay for copying bills, the Controller's books showing that that amount was expended by the two previous sessions when the office of Copying Clerk was in existence. Add this item (copying bills, \$13,420) to the actual amount saved on the printing, and we find the total sum in favor of the State, and the present method of doing the public printing, to be \$95,450 34—for the three and a half years, ending June 30th, 1879.

Respectfully submitted,

F. P. THOMPSON.
Supt. State Printing.

APPENDIX.

Showing the name, weight, and number of reams of paper stock purchased, consumed, and on hand, up to July 1st, 1879.

KIND AND QUALITY OF STOCK.	Weight in pounds	RECEIVED.		USED.		ON HAND.	
		Reams.	Sheets.	Reams.	Sheets.	Reams.	Sheets.
Book -----	70	599	240	424	240	175	-----
Book -----	48	939	-----	625	240	313	240
Book -----	40	1,958	-----	1,667	-----	291	-----
News -----	-----	759	-----	749	-----	10	-----
Imperial -----	-----	17	-----	16	428	-----	52
Super-royal -----	54	23	-----	13	87	9	393
Royal -----	44	15	-----	7	390	7	90
Medium -----	36	74	-----	62	188	11	292
Folio post -----	24	189	-----	109	-----	80	-----
Folio post -----	22	202	-----	130	-----	72	-----
Folio post -----	20	10	-----	10	-----	-----	-----
Folio post -----	18	10	-----	10	-----	-----	-----
Demy -----	28	190	-----	174	140	15	340
Flat cap -----	20	163	-----	47	-----	116	-----
Flat cap -----	18	181	-----	118	-----	63	-----
Flat cap -----	16	282	-----	119	-----	163	-----
Flat cap -----	14	457	-----	301	-----	156	-----
Cap (double) -----	28	2	-----	2	-----	-----	-----
Flat letter -----	12	358	-----	187	-----	171	-----
Flat letter -----	10	324	-----	135	-----	189	-----
Bond paper -----	-----	-----	59,000	-----	33,500	-----	25,500
Ruled letter -----	16	80	-----	6	-----	74	-----
Ruled letter -----	12	65	-----	8	-----	57	-----
Ravelstone letter (ruled) -----	12	84	-----	62	-----	22	-----
Carew note -----	-----	75	-----	66	-----	9	-----
Brief paper -----	-----	14	-----	12	-----	2	-----
Cigarette paper -----	-----	10	-----	4	-----	6	-----
Blotting paper -----	-----	1	-----	-----	-----	1	-----
Parchment -----	-----	-----	977	-----	875	-----	102
Post-office paper -----	-----	13	-----	8	-----	5	-----
Manilla paper -----	-----	10	-----	8	-----	2	-----
Cover paper (assorted) -----	-----	283	-----	113	240	169	240
Card-board -----	-----	-----	1,505	-----	1,160	-----	345
Bristol cards (No. 9) -----	-----	-----	15,000	-----	13,000	-----	2,000
Envelopes (No. 5) -----	-----	-----	51,500	-----	37,500	-----	14,000
Envelopes (No. 6) -----	-----	-----	115,250	-----	87,250	-----	28,000
Envelopes (No. 9) -----	-----	-----	35,250	-----	23,750	-----	11,500
Envelopes (No. 10) -----	-----	-----	68,000	-----	40,750	-----	27,250
Envelopes (No. 11) -----	-----	-----	7,200	-----	1,200	-----	6,000
Envelopes (No. 12) -----	-----	-----	51,200	-----	26,700	-----	24,500
Envelopes (No. 14) -----	-----	-----	13,200	-----	12,950	-----	250

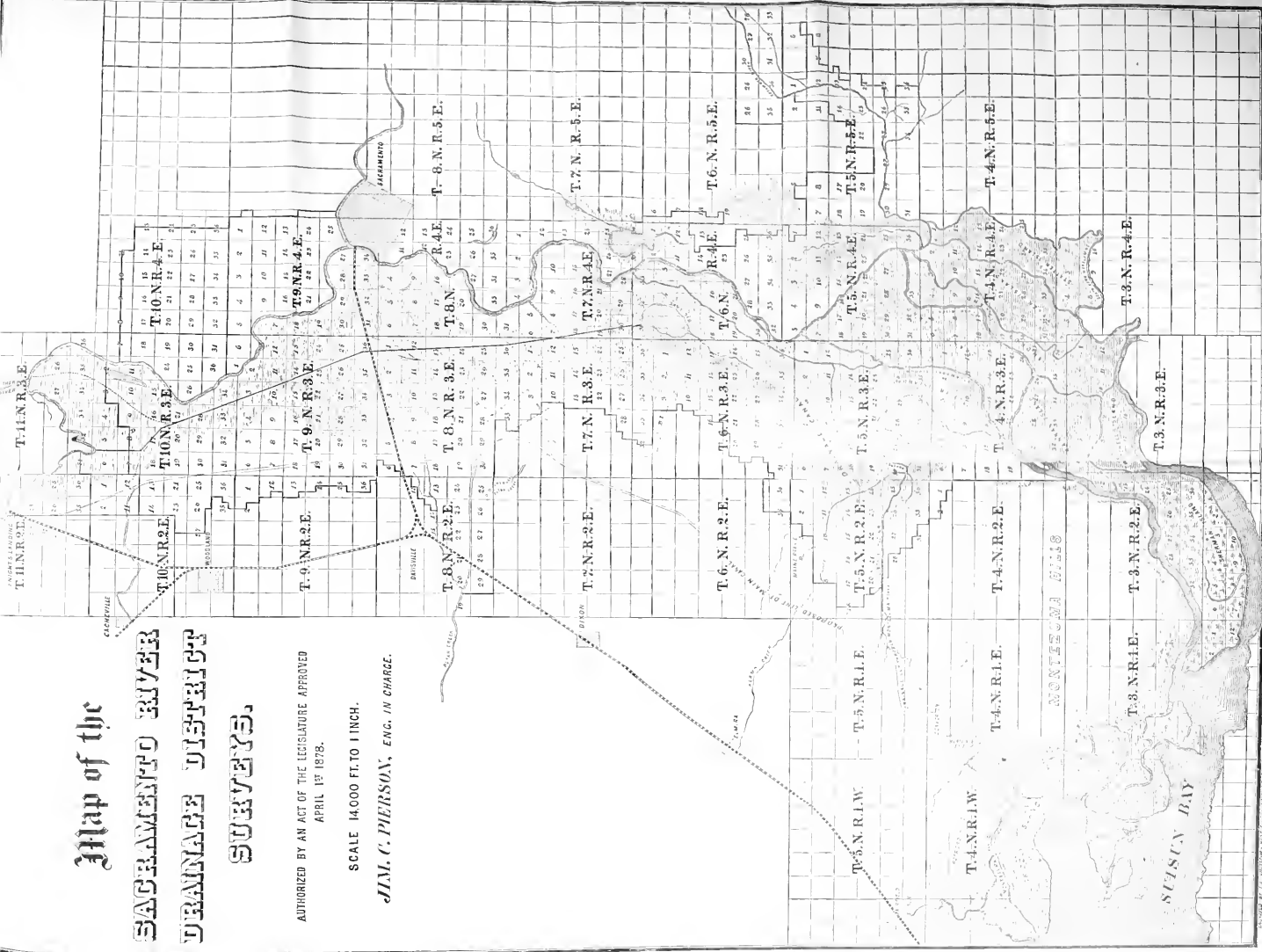
Map of the

SACRAMENTO RIVER DRAINAGE DISTRICT SURVEYS.

AUTHORIZED BY AN ACT OF THE LEGISLATURE APPROVED
APRIL 13TH 1878.

SCALE 14,000 FT. TO 1 INCH.

JIM. C. PIERSON, ENG. IN CHARGE.



REPORT OF THE BOARD OF COMMISSIONERS

OF THE

Sacramento River Drainage District

TO THE

GOVERNOR OF CALIFORNIA.



COMMISSIONERS' REPORT.

OFFICE SACRAMENTO RIVER DRAINAGE DISTRICT, }
SACRAMENTO, CALIFORNIA. }

To His Excellency, William Irwin, Governor of California :

We, the undersigned, the Board of Commissioners of the Sacramento River Drainage District, a Board appointed in accordance with a provision of the Legislature of the State of California, at its last regular session, entitled "An Act creating the Sacramento River Drainage District, to inquire into the practicability of and the cost of constructing certain works described therein, for the purpose of draining the surplus water of the Sacramento River, and the waters flowing from the Coast Range of Mountains on the west, into the tule basin to the west of the Sacramento River, and south of Knight's Landing into Suisun Bay," do herewith submit the following report of action had under said Act :

The sum of \$10,000 was appropriated by the Legislature out of the general funds of the State, and placed at our disposal for the purpose of making surveys and examinations to determine : first, the practicability of the certain works described in the Act ; secondly, the effect the proposed works would have on the Sacramento River, Suisun Bay, and other navigable waters of the State ; and thirdly, the cost of constructing said works.

THE BOARD ORGANIZED.

Agreeable to Section 2 of the Act, the Commissioners, after their appointments, organized, electing R. S. Carey, President, Christopher Green, Secretary, and appointing Isaac W. Smith, Chief Engineer, James C. Pierson, Assistant Engineer, on the 1st day of May, 1878.

ELECTION OF TREASURER.

Under Section 6 of the Act, and agreeable thereto, an election was held on the 6th day of July, 1878, for the purpose of electing a Treasurer, resulting in a tie vote. No further action was had pending the decision of the Board, who took the matter under advisement. The expense of such election was paid from the moneys of the fund hereinbefore mentioned.

SURVEYS COMMENCED.

Prior to June 1st, 1878, a surveying party, with James C. Pierson as Engineer in Charge, was organized, and placed in the field on June 1st, for the purpose of making the necessary surveys and examinations. Work was immediately commenced and unremittingly prosecuted up to the 5th day of November following, at which time the surveys were discontinued and the work of compiling the data thus obtained was commenced. Complete maps, plans, and estimates

were made and submitted, together with the report of Engineer Pierson of the work done, to the Board and Chief Engineer, the following June.

WORK DONE IN CONNECTION WITH THAT OF THE STATE ENGINEER AND THE UNITED STATES ENGINEER DEPARTMENT.

Inasmuch as the appropriation was inadequate to meet the expense of a complete examination of the Sacramento River in addition to other work necessary to be done, an agreement was entered into with the State Engineer, whereby he agreed, in consideration of the use and benefits of the information gained in our surveys and examinations, to furnish us all necessary data in regard to the Sacramento River that he might obtain. Such data was furnished and placed in the hands of Engineer Smith. We also received much information from Colonel G. H. Mendell, of the United States Engineer Department, who likewise received the benefits of a portion of our surveys. In this way we were enabled to obtain much valuable information not otherwise to have been obtained.

REPORT OF CHIEF ENGINEER.

The report of Isaac W. Smith, Chief Engineer to our Board, was submitted November 29th, 1879, and has been placed before the public through the medium of the Sacramento Record-Union. The report shows conclusively the impracticability of constructing the proposed works, and, therefore, agreeable to Section 3 of the Act, no further proceedings have been had. A copy of the report of the Engineers accompany this document. Copies have also been filed with the Secretary of State and the Surveyor-General.

THE MONEY EXPENDED.

The following is a recapitulation of the expenditures under Section 3 of the Act, vouchers in detail being on file in the State Controller's office:

For outfitting surveying party, for necessary running expenses of same, for office work, and for salaries	\$9,581 65
Expenses attending the election of Treasurer.....	166 00
Expenses of reconnoissance party, consisting of the Governor, the Commissioners, the Engineers, and the Consulting Engineers.....	252 35
Total.....	\$10,000 00

It may be well to remark here that the Commissioners and Secretary have received no compensation for their services or expenses, the Act providing that that be paid out of the Construction Fund, but as no such fund was created, owing to the adverse report of the Engineers, it will be necessary that further legislation shall be had in order to meet this demand. Also, that a portion of the services of the Engineers is still unpaid, owing to the fund becoming exhausted prior to the completion of their labors.

THE REPORTS OF THE ENGINEERS VERY COMPLETE.

The reports submitted by the Engineers are very complete in detail, and embrace an amount of valuable information, well compiled, that

has probably never been equaled by the expenditure of a like sum of money by the State, and we consider the State is well requited in the valuable information contained in the reports and maps accompanying the same.

RELIEF WORKS IN THE FUTURE.

The work done and the information gained while complete, so far as the requirements of the Act make it obligatory, is not sufficient to determine the practicability of other plans which may come before the people hereafter, and we, therefore, deem it of great importance that the work of making examinations be continued, and that the most searching and thorough examinations be made of that portion of the district embracing Cache Slough, the mouth of the Sacramento River, and those sloughs emptying into the San Joaquin and Mokelumne Rivers. This work is necessary, in order to complete and perfect the information so far gained in regard to this district.

RECOMMENDATIONS.

Inasmuch as the report of the Engineers is adverse to the construction of the works, as provided for in the Act, and as it demonstrates the futility of constructing any works of a relief nature in this district while such are exposed to the disastrous consequences which might follow relief measures undertaken by other districts, in the control of which we have no voice, we, therefore, recommend that no legislation be had with a view of constructing any works of this nature until such a time as a Board of competent engineers shall have examined into and reported on a scheme that shall embrace the question of relief and reclamation, with all its corollaries. Furthermore, as the mining debris in the Sacramento River and its tributaries forms an important factor in the consideration of all questions pertaining to a solution of this problem, and as such brings the interests of a large branch of the mining industries of the State in direct relation to those interests requiring relief and protection; and as the other districts are directly interested with this district in this and all questions of relief, although the latter receive direct nearly all the debris brought down by the Feather and American Rivers and their tributaries, and as, on account of this debris, the problem of improving the capacity of the Sacramento River is rendered more difficult, and is without a precedent; we, therefore, further recommend, that all the lowlands of the Sacramento Valley that need, or may need, reclamation or relief works be embraced in one district, under one control, that complete examinations may be undertaken to determine the most practicable and advantageous mode of relief of the whole; *provided*, the forthcoming report of the State Engineer does not already cover this ground, which is not to be expected, owing to the limited time he has had in which to make examinations adequate to a solution of this vast problem.

Respectfully submitted, this 15th day of December, A. D. 1879.

R. S. CAREY, President,
W. F. KNOX,
R. S. EGBERT,
Board of Commissioners.

CHRIS. GREEN, Secretary.

CHIEF ENGINEER'S REPORT.

CHIEF ENGINEER'S OFFICE, SACRAMENTO RIVER DRAINAGE DIST., }
SACRAMENTO, November 28th, 1879. }

The Board of Commissioners Sacramento River Drainage District:

GENTLEMEN: By the Act creating the Sacramento River Drainage District, it is made the duty of the Engineer or Engineers, to be appointed by you, to make a preliminary survey for the purpose of ascertaining the feasibility, effectiveness, and probable cost of the works defined in Section 1 of the Act, and, also, upon the completion of such survey, to make a full report thereof to your Board.

It is further provided "that if said Engineers shall report that, in their opinion, such proposed works are not feasible, or will not be reasonably effective for the purposes intended, or will cause material injury to Suisun Bay or other navigable waters of the State, or to any private lands, or that the probable cost thereof will exceed the amount of money for which bonds are authorized by the Act to be issued, then, and in that event, no further proceedings shall be had under the Act."

The report of the preliminary survey, with the details of the field work and the plans, sections, and calculations pertaining thereto, has been submitted to your Board under date of June 3d, 1879.

The report now submitted is with reference to the general results of the survey, and the conclusions deduced therefrom with regard to the feasibility, efficiency, and probable cost of the works proposed.

This report, by consent of your Board, has been deferred until certain data, now furnished, and necessary for the solution of the questions involved, could be obtained from the State Engineer.

THE OBJECT AND NATURE OF THE PROPOSED WORKS.

The object of the proposed works, as defined in the first section of the Act creating the drainage district, is to prevent overflow of the lands adjacent to the river, by "draining the surplus waters of the Sacramento River, and the waters flowing from the east side of the Coast Range of Mountains, in the counties of Yolo and Solano, into Suisun Bay."

It is provided in the same section that "said object shall be effected by the construction of the following works, to wit: A main canal, leading from the Sacramento River, at or near the place called Charleston, or Gray's Bend, in Yolo County, and running in a southerly and southwesterly direction to the basin of Nurse's Slough, in Solano County, and thence to Suisun Bay; the waters coming from the Coast Range of Mountains, from Cache Creek southerly, to be diverted and turned into said canal; also, in connection therewith, an auxiliary canal, if necessary, leading from the Sacramento River,

near the mouth of the American River, to said main canal; also, such auxiliary works as may be necessary for constructing or protecting said canals, or for rendering them effective."

THE PROPOSED CANAL NOT A DRAINAGE CANAL.

It may be here stated, to correct a popular misapprehension as to the object and nature of the proposed works, that the location of the main canal must depend on the height of the head at junction with the river, and on the slope necessary to give a safe velocity to the current, with as light a cut as possible through the Montezuma Hills, and that the location of the canal cannot, therefore, under any circumstances, be at such level as to drain the tule lands on the west side of the river, nor is there any provision made to drain the waters from those lands in case of overflow.

THE AUXILIARY CANAL.

An auxiliary canal from the mouth of the American River to the junction with the main canal would be about ten miles in length, extending across the low tule lands on the west of the Sacramento, with levees from twelve to nineteen feet in height.

In case of overflow from Cache Creek, or the Sacramento River above the mouth of the American, these levees would be either carried away or would dam up the waters as far as Knight's Landing, forming a deep lake, without drainage, over twenty miles in length and several miles in width.

The construction of the auxiliary canal would, therefore, in my opinion, be warranted only on the assumption that by means of the proposed works the waters of the Sacramento, and in the main canal, would always, and during all floods, be restrained within their banks, a result not likely to be attained by any system of works which may be devised.

Aside from the questions of cost and risk, there are other reasons which would render the construction of the auxiliary canal unadvisable and impracticable.

The difference in the flood-heights at the heads of the main and auxiliary canals is about eleven feet; the distance from the head of the main canal to the junction is about 22 miles, and from the junction to the head of the auxiliary canal, about 10 miles.

A grade of six inches to the mile, in the main canal, would, therefore, bring the point of junction on a level with the head of the auxiliary canal, and, in order to insure a proper fall to the latter, the main canal should have a fall of at least nine inches to the mile, increasing the cut through the Montezuma Hills to such an extent as to render the construction of the works practically impossible. The auxiliary canal may, therefore, be dismissed from consideration, and the proposed works will be limited to the main canal and the works necessary for its security and protection.

ON THE FEASIBILITY AND EFFECTIVENESS OF THE PROPOSED WORKS.

The purpose to be accomplished is the prevention of overflow, and in order that the proposed works may be feasible and effective for that purpose, it must be possible, with a reasonable assurance of

safety and permanence, and under circumstances now prevailing, or likely to prevail in the future, to accomplish the following results:

First—To divert and turn into the main canal the surplus waters of the Sacramento River.

Second—To divert and turn into the main canal the waters now draining from the Coast Range into the tule lands on the west of the river.

Third—To convey the waters turned into the main canal into Suisun Bay.

These three results are, in a measure, independent of each other, and will be considered separately.

THE DIVERSION OF THE SURPLUS WATERS OF THE SACRAMENTO RIVER INTO THE MAIN CANAL.

As regards the best disposition of surplus waters, whether by diversion or concentration within the channel of the stream, there exists a difference of opinion among authorities in hydraulic science.

By some it is maintained that at or near the time of maximum discharge the variation of velocity is sensibly equal to the variation of discharge; that, therefore, a large variation of flood-discharge, whether by reduction or increase, is attended by no sensible change of volume or height, and that this fact, independently of other considerations, is sufficient to condemn all schemes for the improvement of rivers by the division of their waters into separate channels.

There are others who admit the undoubted fact that the surplus waters, if confined within the channel by raising the levees to a sufficient height, would occupy a much less space than when diverted into a separate channel, but maintain that the comparative merits of the two systems cannot be settled by any general law, and must, in any particular case, be determined by considerations of practicability, cost, and security.

The discussion, in the present case, of the comparative merits of the concentration or diversion of flood-waters, for the prevention of inundation, would involve the consideration of what, under circumstances likely to occur in the future, would be the flood-heights and discharges at different sections of the river, and the height and cost of the levees necessary for the prevention of overflow, questions which the data at my disposal do not enable me to decide, and on which I am not called upon to express an opinion.

If a report were required, not only on the feasibility and efficiency of the works proposed, but on the advisability of constructing them, under the conditions prescribed by law, and in advance of the forthcoming report of the State and Consulting Engineers, I should give it as my opinion that, to enable the owners of the land to be protected, and the capitalists who are expected to advance funds on the security of the lands, to judge intelligently on the merits of one system of works, they should be furnished with the data to enable them to understand whether the purpose in view might not be accomplished with greater certainty and at less cost under other systems, and that no action under the provisions of the Act creating the Sacramento River Drainage District would be advisable prior to a thorough investigation as to the system best adapted to the protection of all the lands bordering on the Sacramento River, considered as a connected whole, and not in independent parts. As, however, by the

terms of the law, this report must be confined to the absolute, rather than to the relative merits of the proposed system of works, such subjects only, will be considered as have a direct bearing on the questions proposed for solution.

THE AMOUNT OF THE SURPLUS WATERS OF THE SACRAMENTO RIVER.

Under the provisions of the Act creating the Sacramento River Drainage District it is proposed to construct, at or near Gray's Bend on that river, a permanent outlet, the discharge through which, under circumstances likely to occur in the future, will be sufficient to reduce the flood-discharge at all sections below the outlet to such extent as to afford a reasonable security against overflow, and, as no provision is made for raising the levees, the reduction of flood-discharge must be such that the flood-surface of the river will be confined to a safe distance below the line of the top of the levees as they now stand, or as they would stand if repaired and perfected to their present height. To determine what, under any special conditions, would be the reduction of flood-discharge necessary to bring about the requisite reduction of flood-heights, it would be necessary to know the amount of the discharge to be reduced and the safe discharge to which it is to be reduced. The feasibility of the diversion of the surplus waters, and the effectiveness of the works proposed for that purpose, will depend on the amount of the requisite reduction of discharge, and the only practical method of calculating this amount is that adopted by Humphreys and Abbott for the purpose of determining the discharge through a proposed outlet at Bonnet-Carre Bend, which would reduce the flood-heights of the Mississippi River to a safe distance below the level of the top of the existing levees.

As a measure of the flood-discharges to be provided against in the future, the maximum discharge of the flood of 1858 was adopted.

The difference between the maximum discharges of 1858 and 1851, amounting to 150,000 cubic feet per second, was assumed as the reduction of the discharge necessary to reduce the flood-heights of 1858 to those of 1851.

The flood-surface of the river in 1851 stood 1 foot below the level of the top of the existing levees, and it was assumed that a further reduction of height, to the amount of $3\frac{1}{10}$ feet, would be necessary for the stability of the banks and levees. The reduction of discharge, to reduce the height $3\frac{1}{10}$ feet, was assumed, from experimental data, to be 150,000 cubic feet per second, making the total reduction of discharge 300,000 cubic feet per second, or over one-fourth of the maximum discharge of the river, and this amount was assumed also as the outlet discharge which would be necessary to produce the required reduction of the flood-discharge and surface height, not only at the Bonnet-Carre Bend, but for "many miles above and below." The amount of the outlet discharge was so great as to warrant the opinion that the opening of an outlet of the requisite dimensions would not be advisable on account of the extent and costly character of the works for diverting and disposing of the surplus waters; the injury to the navigation of the lake into which the waters would be conducted; the great dimensions of the outlet and the impossibility of preventing the current from excavating the bed, although of clay from eighteen to twenty feet in thickness; and the danger that the outlet would ultimately become a main branch of the river, seriously impairing the navigation at its present mouth.

The general conclusion reached by Humphreys and Abbott, with regard to outlets, as a means of protection against floods on the Mississippi River, was to the effect that they "are of great utility, as far as the river is concerned, but are virtually impracticable from the difficulty of disposing of the water," and that their observations demonstrated "with all the certainty of which the subject is capable, the disastrous consequences that must follow the resort to this means of protection."

The opinion as regards the advantages to the Mississippi are, however, based on conditions which do not exist in the case of the Sacramento, and the great utility of an outlet, so far as any river is concerned, may be doubted in a case like that above cited, where the amount of the surplus water is so great that there would be danger that the outlet would become a main branch of the river, and seriously impair the navigation at its present mouth.

THE AMOUNT OF THE SURPLUS WATERS OF THE SACRAMENTO RIVER DURING
THE FLOOD OF MARCH, 1879.

The only data concerning the discharge of the Sacramento River are the measurements by the State Engineer, during the flood of the past year, and the amount of the surplus waters during that flood is the only basis for an estimate of what will be the amount under circumstances likely to occur in the future.

The elevations of the top of the levees above the flood-surface of the river, at different points, from Butte City, 173 miles above New York Landing, to Collinsville, near the mouth of the river, were as follows:

At Butte City	1.9 feet.
At Princeton	2.0 feet.
At Colusa	2.2 feet.
At Butte Slough	2.3 feet.
At Meridan	1.5 feet.
At Winn's Landing	1.0 feet.
At Gray's Bend	2.6 feet.
At mouth of Feather River	1.6 feet.
At break above Gray and Shaw's	1.9 feet.
At Sacramento City	2.5 feet.
At Clarksburg	2.9 feet.
At Collinsville	1.6 feet.

As the levees are practically adapted to the flood-heights of the river, these elevations illustrate the fact that, within certain limits, a safe discharge at one section is attended with a safe discharge at all others, although the amount of those discharges may be very different, but it is customary to assume that under a safe discharge the water surface will be at least three feet below the level of the levees.

The distances from Colusa to points named below are as follows:

To Knight's Landing	56 miles.
To Gray's Bend	60 miles.
To mouth of Feather River	70 miles.
To Gray and Shaw's Station	75 miles.
To mouth of American River	90 miles.
To Sacramento City	91 miles.
To Freeport	104 miles.
To Rio Vista	132 miles.

Knight's Landing is at the upper limit of the Sacramento River Drainage District, and, for reasons hereinafter stated, is the proper point for the proposed outlet.

During the March flood of 1879 a large portion of the flood-waters of the upper river and its tributaries discharged into an immense basin east of the Sacramento and between that river and the Feather, and flowing through that basin were returned, with the waters of the Feather, into the Sacramento River.

Knight's Landing is on a ridge of land which intercepts and turns into the river all the waters on the western side, and hence the whole of the flood-waters of the upper rivers were returned into the channel between Knight's Landing and the mouth of Feather River.

A large portion of these waters were again diverted through crevasses, between Knight's Landing and Freeport, into the tule basin on the west of the river, and, with the waters of Cache, Putah, and other streams from the Coast Range, were discharged through that basin and Cache Slough into the river above Rio Vista.

As none of the waters escaped below Feather River on the eastern side of the Sacramento, the whole of the flood-waters of the river were discharged either through the channel at Freeport, thirteen miles below Sacramento City, or through crevasses opening into the tule basin on the western side, between Knight's Landing and Freeport.

If, therefore, the surplus waters of the river during any flood are those which cannot be confined to a safe distance below the top of the levees, and during the March flood of 1879 the discharge through the channel could not have been safely increased, the crevasse discharge between Knight's Landing and Freeport may be assumed as the measure of the surplus waters, under the special conditions of that flood.

The amount of the crevasse discharge between Knight's Landing and Freeport Station may be estimated as follows:

The maximum discharge through the tule basin was measured under the piling of the California Pacific Railroad, which extends from Sacramento City westward across the basin.

This discharge amounts to 66,000 cubic feet per second, and the whole of the water was from Cache Creek, and from the crevasses between Knight's Landing and Sacramento City.

The maximum discharge of Cache Creek occurred on the 5th of March, seven days before the maximum discharge under the railroad pilings, and eight days before the maximum discharge at Freeport, and was calculated from the measured area of the high water section, the wet perimeter and the slope of the bed. By Jackson's formula it amounted to 35,000 cubic feet per second, and by the ordinary formula to over 40,000 cubic feet. It was estimated, approximately, by the State Engineer, at 34,000 cubic feet, from independent data.

Assuming the maximum discharge of Cache Creek at 35,000 cubic feet per second, and that the maximum discharge under the railroad pilings could not have exceeded the sum of the maximum discharges from Cache Creek and from the crevasses between Knight's Landing and Sacramento City, the latter discharge was at least 31,000 cubic feet per second, and as Cache Creek rises and falls very rapidly, it is probable that the crevasse discharge was over 40,000 cubic feet, a result which may be checked by an independent method of calculation based on the following premises:

The amount of the maximum discharge at a lower section of a stream, at any given time, will depend not only on the discharges at that time at different points above, but on the positions of the outlets and inlets, and the velocities of transmission and the times of arrival of the flood-waves from the different sources of supply.

When, however, the discharges are all uniform for a period of time sufficient for their transmission between the extreme points of discharge, the discharge, at a given time, at the lowest point, will be nearly the difference between the sums of the discharges, at that time, of the outlets and tributaries above. During the March flood of 1879 current measurements were made at four points on the river, and the maximum discharges at those points were as follows, in cubic feet per second:

At Colusa	62,000
At Knight's Landing	23,000
At Gray and Shaw's	66,000
At Freeport	69,400

The Freeport maximum discharge occurred on the 13th of March, and the water was supplied through the channel at Knight's Landing, and from the Feather and American Rivers and basins.

The discharges from these sources on the 13th day of March were as follows, in cubic feet per second:

From Knight's Landing	19,500
From Feather River and basin	65,800
From American River and basin	31,000
Total	116,300

The discharge at Knight's Landing is from actual measurement, and the discharges from the Feather and American Rivers and basins from measurements, or estimates based on measurements, by the State Engineer.

The gauge readings at Knight's Landing, Gray, and Shaw's, and Freeport, did not vary $\frac{3}{16}$ of a foot from the 11th to the 14th of March, and the discharges at those points were, therefore, practically uniform during that period.

Assuming that no new crevasses were opened or increased about the 13th of March, the crevasse discharge was uniform, because the height of the adjacent river surface did not change.

As the river discharge at Gray and Shaw's, below Feather River, and at Freeport, below the American River, remained constant for several days, no great change of discharge could have occurred either from Feather River and basin or American River and basin.

Under these assumptions the discharge at Freeport would have been 116,300 cubic feet per second, had there been no crevasse discharge, and as the actual measured discharge was 69,400 cubic feet, the crevasse discharge was 46,900 cubic feet per second.

The result in the former estimate would have been the same, by assuming the Cache Creek discharge at 19,100 cubic feet per second.

The discharge from crevasses between Gray and Shaw's and Freeport may be estimated in a similar manner.

The water flowing through the channel at Freeport, March 13th, was from the channel at Gray and Shaw's, 29 miles above, and from the American River and basin, 15 miles above Freeport.

If no water had escaped through crevasses below Gray and Shaw's, the Freeport discharge would have been as follows, in cubic feet per second:

From Gray and Shaw's (gauged)	60,500
From American River and basin	30,900
Total	91,400
The actual discharge was	69,400

The crevasse discharge between Gray and Shaw's and Freeport was, therefore, 22,000 cubic feet per second.

These estimates are based on data which may be, to some extent, incorrect, but they are sufficient to warrant the opinion that the crevasse discharge between Knight's Landing and Freeport, during the flood of March, 1879, was at least 30,000, and probably over 40,000 cubic feet per second, and it is sufficient for all the purposes of this report to assume it at the former figure.

Supposing, however, the crevasse closed, and the crevasse discharge concentrated through an outlet at Knight's Landing, would the safe discharge of the channel below and the amount of the surplus waters have remained the same?

As the flood-surface of the river was on a stand for several days, it may be assumed, with sufficient accuracy, that each outlet reduced the discharge of the river below by an amount equal to the outlet discharge.

If, therefore, the whole crevasse discharge had been concentrated through one outlet at Knight's Landing, the reduction of discharge would have been the same at sections below the lowest crevasse, but greater at sections above, and the effect on the height of the lower sections at least nearly the same.

At sections near Gray's Bend the reduction of discharge would be much greater, but such reduction could not have its normal effect in reducing the depth, unless a corresponding reduction of the flood-height should take place below.

The maximum discharge, for instance, at Knight's Landing, was reduced over 50 per cent. by the crevasse discharge above, yet the flood-height was but little affected on account of the height of the river at the mouth of Feather, due to the largely increased discharge at that point.

It must also be considered that if all the crevasses from Knight's Landing to the mouth of Feather had been closed, the discharge below the mouth would not probably have exceeded 80,000 cubic feet per second, and the reduction of this discharge by 30,000 cubic feet would, for reasons hereafter stated, have resulted in an elevation of the bed which might have neutralized the effect of any diminution of depth which might have followed the diminution of discharge.

The crevasse discharge of the river below Knight's Landing may, therefore, be assumed as the measure of an outlet-discharge at that point, which would have been necessary to have maintained the flood-surface of the river at from $1\frac{1}{2}$ feet to 2 feet below the top of the levees during the March flood of 1879.

THE AMOUNT OF THE SURPLUS WATERS OF THE SACRAMENTO RIVER DURING THE FLOOD OF 1878.

No measurements of discharge were made during this flood, but the flood-surface stood, at a point near Freeport, $1\frac{6}{10}$ feet higher than during the flood of 1879.

At Freeport during the latter flood an increase of 5,000 cubic feet per second caused a rise of 1 foot near the time of high water, and the flood-discharge at Freeport during the flood of 1878 may, therefore, be assumed at 8,000 cubic feet per second greater than that of 1879.

The amount of water running through the tule basin on the west of the river was greater than in 1879, and caused great damage to the railroad embankments as well as to private property.

If this increase of discharge through the tules, due to the crevasse discharge from the rivers, be assumed at 6,000 cubic feet per second greater than in 1879, the surplus waters in 1878 would have been 14,000 cubic feet per second greater than in the flood of 1879, or at least 45,000 cubic feet per second.

THE AMOUNT OF THE SURPLUS WATERS UNDER DISCHARGES LIKELY TO OCCUR IN THE FUTURE.

The amount of the maximum discharge, and of the surplus waters of the river, will depend upon circumstances which cannot, at the present time, be foreseen or controlled; but it is certain that, under conditions which may probably occur, this discharge may be largely increased.

The Sacramento, Feather, and American Rivers, at high water stages, now communicate directly with immense reservoir basins, which under ordinary circumstances hold back the flood-waters and modify and reduce the flood-discharges.

At high water of the flood of 1879 the contents of the basin between the Feather and upper Sacramento Rivers amounted to 45,000,000,000 cubic feet, and those of the American River to over 17,500,000,000.

With a flow of 40,000 cubic feet per second, thirteen days would be required to fill the former and five days for the latter. During the flood of March, 1879, the maximum discharge at Colusa, on the main Sacramento, was 62,000 cubic feet per second, and at Knight's Landing, 56 miles below, but 23,000 cubic feet, this great reduction being due to the diversion of a large portion of the flood-waters into the Feather River basin.

A portion of these waters, and of those of the Feather and other tributaries, are held back, and the remainder discharged into the Sacramento near the mouth of the Feather, and this basin and that of the American River exert an important influence on the maximum discharge of the river below.

If all the waters of the Sacramento and its tributaries should be confined within their channels, by raising the levees to a sufficient height, the flood-discharge on Gray's Bend would be more than doubled, and at other sections largely increased. The amount of this increase, under the conditions likely to occur in the future, will be considered in the forthcoming report of the State Engineer, to whom I am indebted for all of the data used in the foregoing discussion.

The facts stated above are sufficient to warrant the opinion that with regard to any works which may be now constructed to divert the surplus waters of the Sacramento, under circumstances likely to occur hereafter, they may be either insufficient for the purpose intended, or must be planned at great cost to meet difficulties which may never arise.

THE POSSIBILITY OF THE DIVERSION OF THE SURPLUS WATERS OF THE SACRAMENTO THROUGH AN OUTLET AT OR NEAR GRAY'S BEND.

The maximum discharge at Knight's Landing, near Gray's Bend, during the March flood of 1879, was but 23,000 cubic feet per second, and would be less, should the flood be caused by a rise of the American and Feather Rivers.

Estimating the surplus waters of the rivers even at 30,000 cubic feet per second, they would exceed the whole flow of the river adjacent to the proposed outlet, and to effect the proposed diversion, a portion of the discharge must be taken from the river below the mouth of the Feather, producing an up-stream current, and necessitating a low water instead of a high water outlet; but even supposing the proposed diversion possible, the elevation of the bed at the mouth of the Feather, and below, might neutralize the depression of the surface due to the reduced discharge.

It is maintained by Humphreys and Abbott, in their report on the Mississippi River, that no elevation of the bed from deposit of materials can ever occur in that river below a practicable high water outlet, because the waters are never charged to their full capacity with suspended matter, and the maximum power of the current for transporting the materials along the bottom is never called into requisition. The case is, however, very different in the Sacramento River.

The waters of the main Sacramento are comparatively clear, but the debris from the hydraulic mines on the upper waters of the American and Feather Rivers is accumulated during the low water season, and the flood-wave of the waters, surcharged with suspended matter, is accompanied by a wave of materials transported along the bottom, so that at many points the elevation of the bed is greatest at the time of highest water, both in the upper and lower rivers, as is shown by sections and measurements made by Colonel Mendell, of the United States Engineer Corps, and by the State Engineer.

The flood-waters of the Feather and American Rivers being now surcharged with suspended matter, the diversion of the clear waters from the Sacramento, and the reduction of velocity at points below the outlet, would diminish the capacity of suspension and of transporting the materials along the bottom, and would cause an elevation of the bed at the precise stage of water when such elevation might be attended with the most disastrous consequences.

OPINION AS TO THE POSSIBILITY OF DIVERTING THE SURPLUS WATERS OF THE SACRAMENTO INTO THE PROPOSED MAIN CANAL.

It has been shown that the amount of the surplus waters was at least 30,000 cubic feet per second during the flood of 1879, and greater during that of the preceding year; and that, under circumstances which may probably occur in the future, it may be largely increased.

And I am of opinion, for the reasons stated above, that the proposed diversion cannot be accomplished by an outlet at Gray's Bend, or elsewhere, even under the conditions of such a flood as that of March, 1879.

THE DIVERSION INTO THE MAIN CANAL OF THE WATERS FROM THE COAST RANGE, ON THE WEST OF THE SACRAMENTO VALLEY.

The question now to be considered is, whether these waters can be safely conducted *into*, not *through*, the main canal, the possibility of conducting them safely to Suisun Bay being a subject of after consideration.

It is characteristic of all the streams, large and small, from the Coast Range on the west of the Sacramento Valley, that owing to their steep slopes and the rapid drainage of the rain-fall they bring down to the margin of the foot-hills large quantities of materials, with which they build out their beds and channels into the valley, on tongues of land elevated above the level of the adjacent country.

As the elevation of the beds increases the slope and velocity diminish, and the volume of the water increases until the stream is diverted into another channel, and the same process is again commenced.

The principal streams flowing into the tule basin are Cache and Putah Creeks. Cache Creek formerly emptied into the Sacramento River at Knight's Landing, the old bed being still visible at that point. The tongue or ridge of land at that point, which now divides the upper and lower tule basins on the west of the river, was doubtless formed from deposits from Cache Creek, which now sinks into the tules 5 miles to the south and 10 feet below the level of its former banks. The average fall of the present bed, from a point $6\frac{1}{2}$ miles above its junction with the proposed line of the main canal, is over 4 feet to the mile.

The area of the high water section March 5th, 1879, at that point, was 3,558 square feet; the mean depth, $23\frac{25}{100}$ feet; the slope of the bed 1 foot in 1,000; the mean velocity, from these data by Jackson's formula, 10 feet per second, or about 7 miles per hour, and the discharge 35,000 cubic feet per second.

This discharge was estimated from other formula, with the same data, by Mr. Pierson, at 40,600 cubic feet per second, and by the State Engineers, from independent data, approximately, at 34,000 cubic feet.

Putah Creek, at one time, discharged into the tules, about 4 miles south and 5 miles east of its present channel, the tongue of land formed by the deposited materials extending to within 3 miles of the Sacramento River, the width of the tongue, judging from the contour line of the main canal, being over $2\frac{1}{2}$ miles.

From a point $11\frac{1}{2}$ miles above the intersection of the present channel with the line of the main canal, the average slope is over 4 feet to the mile.

At that point the flood-waters are all confined within the banks; the area of the high water section March 5th, 1879, was 5,750 square feet; the main depth, $30\frac{5}{10}$ feet; the wet perimeter 274 feet, and the slope of the bed 1 foot in a thousand.

The measured surface velocity, $5\frac{8}{100}$ feet below high-water, was $12\frac{8}{10}$ feet, and the mean, estimated at $\frac{82}{100}$ of the surface velocity, was $10\frac{5}{10}$ feet per second.

The high water mean velocity, estimated by Jackson's formula, was $11\frac{2}{3}$ feet per second, or over 8 miles per hour, and the maximum discharge 65,000 cubic feet per second.

This discharge was estimated by Mr. Pierson, from the same data, at 77,000 cubic feet per second, or 8,000 cubic feet more than the maximum channel discharge of the river at Freeport, below Sacramento City.

In order that the materials brought down by these streams may not cause a continual elevation of their beds, their velocities must be such as to carry down the materials into the main canal, and the velocity of the main canal must be sufficient to transport the materials from the creeks into Suisun Bay, a result which in neither case can possibly be accomplished, because any increase of the velocity of the creeks, from confinement within the levees, would only result in bringing down the coarser materials still nearer the line of the canal; and as the slope of the canal cannot, without increasing the cut through the Montezuma Hills to an impracticable extent, be more than 4 inches to the mile, it cannot carry off the materials brought down from the beds of the creeks with a slope of over 4 feet to the mile.

I am, therefore, of the opinion that the waters of Putah and Cache Creeks cannot be safely conveyed into the main canal, because of the continuous elevation of the bed of the creeks, and the danger to the levees of the main canal at their mouths.

THE DRAINAGE THROUGH THE MAIN CANAL INTO SUISUN BAY OF THE SURPLUS WATERS OF THE SACRAMENTO AND THE WATERS FROM THE EASTERN SLOPE OF THE COAST RANGE.

On this subject it would not be necessary to speak were it not for the possibility that an intercepting canal may be proposed hereafter under other conditions.

The difficulty in this case arises not so much from the cost and risk of conveying each stream separately into Suisun Bay, but because the waters from the Coast Range, and the surplus waters of the river, must all be carried through the same canal.

The case is very different from the junction of a main stream with its tributaries, for the upper portion of the canal might in some cases be dry at the time of the flood-discharges of Putah and Cache Creeks, and the waters from those creeks would, for a time, run both toward the Sacramento River and Suisun Bay, thus causing a deposit of the materials brought down from the Coast Range.

Independently of this consideration the comparative velocities of the streams from the Coast Range, and of the main canal, is such that the latter can never transport the materials brought into it, and the bed must, therefore, rise until the height of the waters is such as to overflow the levees, and this same objection will, in my opinion, apply to the construction of any canal with a view to intercept and turn the waters of the Coast Range from the present channels.

In the case of small canals and mining ditches, the sediment may be discharged through waste-gates, but this could not be effected in larger canals, unless at great expense and risk.

COST OF PROPOSED WORKS.

By the terms of the law the cost must not exceed \$5 per acre on the lands within the district. The number of acres within the district is as follows:

In Sacramento County	166,121.80
In Solano County	49,281.86
In Yolo County	147,065.32
Total	362,468.98

Limit of cost at \$5 per acre, \$1,812,344 90.

The main canal was located under the following considerations:

The construction of the main canal from Gray's Bend would necessitate the building of high levees across the low tule lands west of that point, and in case of overflow from above these levees would dam up the waters and could not be protected from the action of the wind and waves, unless at great risk and expense.

The canal should, therefore, commence at Knight's Landing, and be conducted along the south slope of the ridge at that point to the firm ground on the west of the tules.

High water at Knight's Landing is 35 feet above ordinary high tide at Denverton, at the head of Suisun Bay, and 4½ feet above the summit of the Montezuma Hills.

The distance by the course of the canal from Knight's Landing to the summit is 43 miles, and to Denverton 46 miles.

Assuming the bed of the canal to fall from 8 feet below high water at Knight's Landing to ordinary high tide at Denverton, the slope would be 7 inches to the mile, and the cut at the summit of the Montezuma Hills over 28 feet, which would be impracticable on account of the cost.

A slope of 4 inches to the mile would give a summit cut of 18 feet, and a fall to high tide at Denverton of nearly 13 feet in 3 miles, which is so great that an overfall of 10 feet would be necessary for the security of the sides of the cut.

The following estimate is made on the basis of a slope of 4 inches to the mile from Knight's Landing to the cut through the Montezuma Hills, and 6 inches through the cut to Denverton; the levees sloping 3 horizontally to 1 vertically on the inside, and 2 to 1 on the outside; 9 feet above grade and 5 feet in width on the top; the cut 600 feet in width at bottom, and with side slopes of 45°.

Such a cut would not have the dimensions to carry off the waters which might be delivered from above, because, with water 10 feet deep and flowing at the rate of 7 miles per hour, the discharge would be but 62,000 cubic feet per second, while the discharge from Putah and Cache Creeks alone, at high water, is over 100,000 cubic feet.

It has not, however, been deemed necessary to calculate the dimensions and slopes for any particular discharge, because, as will be shown, the cost, under the most favorable conditions, will exceed the limit prescribed by law.

The following is an estimate of the excavation and embankment which would be required under the above-mentioned conditions for the main canal from Knight's Landing to Denverton, and for the connections with Putah and Cache Creeks.

	Miles.	Excavation, cubic yards.	Embankment, cubic yards.
Main canal-----	1.04	302,739	-----
Main canal-----	40.36	-----	4,576,569
Main canal-----	4.70	6,269,259	-----
Main canal-----	46.10	6,571,998	4,576,569
Cache Creek-----	4.55	-----	310,146
Cache Creek-----	2.57	458,835	-----
Putah Creek-----	12.36	-----	1,069,334
Totals-----	65.58	7,030,833	5,956,049

Borings to high tide level through the Montezuma Hills demonstrate the fact that there is a narrow ridge of soft sandstone towards the southern margin, which is rather an advantage in case it should be necessary to construct an overflow of 10 feet.

The material of the hills can be easily excavated, but will require a greater side slope than is assumed in this estimate.

The material north of the Montezuma Hills is well adapted for levees.

The cost, including expenses of supervision and contingencies, I estimate at 15 cents for levees and 25 cents per yard for excavation. At these prices the cost of the main canal and auxiliary canals at Cache and Putah Creeks will be as follows, as shown in detail in report of June 3d, 1879:

Excavation—7,030,833 cubic yards at 25 cents-----	\$1,757,708 00
Embankment—5,956,049 cubic yards at 15 cents-----	893,407 00
Total-----	\$2,651,115 00
Limit of cost by law-----	1,812,345 00
Excess-----	\$838,770 00

This cost is estimated for the canals from Knight's Landing to Denverton, not including cost of head-works, overfalls, and auxiliary canals for conducting the smaller streams into the main canal, or cost of right of way.

To continue the canal from Denverton across the tules to Montezuma Slough, a distance of $4\frac{3}{10}$ miles, would require 2,214,000 cubic yards of levee, which, at 15 cents per yard, would cost \$332,000.

In my opinion it would cost less to purchase the tule lands between Denverton and Montezuma Slough, and build a low levee along the margin of the tules for protection against back-water during floods.

The cost of the works would, therefore, in my opinion, even under the most favorable assumptions, exceed, by over \$1,000,000, the limit prescribed by law.

THE PRACTICABILITY AND COST OF DRAINING THE TULE BASIN ON THE WEST OF THE SACRAMENTO INTO SUISUN BAY BY MEANS OF A CANAL THROUGH THE MONTEZUMA HILLS.

By request of your Board I present at the conclusion of my report my opinions with regard to a tidal drainage canal through the Montezuma Hills, based on such information as could be obtained during

the progress of the preliminary surveys of the Sacramento River Drainage District.

Under present circumstances all of the escaped flood-waters of the river below Knight's Landing, with those of Putah, Cache, and other creeks from the eastern slope of the Coast Range, flow into the tule basin on the west of the river, and when the surface level of the accumulated waters rises above that of the river surface, they flow into the river through Cache Slough, along the northern base of the Montezuma Hills.

During the flood of 1878, the high water surface at the southern limit of the basin was 15 inches higher than the flood-surface of the river at the mouth of Cache Slough, and the discharge through that slough, across the river current, banked up the waters of the river, and was the cause of great damage to the levees of the islands lying between the Sacramento and San Joaquin Rivers.

The construction of a drainage canal into Suisun Bay would lower the level of the waters within the basin, and necessitate the building of levees across Cache Slough, to prevent the inflow of waters from the river, and the discharge through the drainage canal, in conjunction with the storage capacity of the basin, should be sufficient to prevent such rise of the waters as would endanger the river levees near the mouth of Cache Slough or elsewhere.

The cost and dimensions of the canal must, therefore, depend on the reservoir capacity of the basin and the amount of the waters to be drained into Suisun Bay.

THE RESERVOIR CAPACITY OF THE TULE BASIN.

In order to determine the cubic contents of the basin, sections were taken at several points, and also the elevations of the flood-surface in the spring of 1878.

From these sections and elevations it is estimated that the cubic contents of the basin, at high water of 1878, amounted to 49,000,000,000 cubic feet, about 4,000,000,000 more than the contents of the Feather River basin at high water of March, 1879.

For the protection of the lands within the basin, as well as for the security of the river levees, the waters of the basin should not be allowed to rise within 3 feet of the level of the flood of 1878, and in such case, and at such level, the cubic contents of the basin would be 32,000,000,000 cubic feet.

These calculations were made from the height of the flood-surface of the water above the lowest line of the tules, as shown on the profile in Sheet No. 2, accompanying this report, and from the assumed width of the surface at the different sections, and the estimate of the cubic contents is, therefore, only approximate, although sufficiently accurate for the purposes of this report.

THE AMOUNT OF THE WATERS TO BE DRAINED FROM THE TULE BASIN INTO SUISUN BAY.

During the flood of 1879 the maximum discharge from Putah and Cache Creeks into the basin was about 100,000 cubic feet per second, and from the river, through crevasses, over 30,000 cubic feet.

The discharge from Putah and Cache Creeks diminished very rapidly, but the river stood at a high stage for nearly a month.

During the flood of 1878 the maximum discharge from Putah and Cache Creeks was not so great, but the crevasse discharge from the river and the discharge through the tule basin was much greater.

If it be assumed that for eighteen and a half days the average flow into the basin would be 40,000 cubic feet per second, it would be sufficient to fill the basin twice over to 3 feet below the level of the flood of 1878, and in order that the waters might not rise beyond that height, it would be necessary that the average discharge of the canal for eighteen and a half days should be 20,000 cubic feet per second.

The basin once filled, however, the reservoir capacity of the basin ceases to reduce the discharge from the lower end, which must then be equal to the whole discharge through the basin.

By reference to the profile on Plate No. II, accompanying this report, it will be seen that the length of a line along the lowest part of the tules is 44 miles, and the average slope of the bed over 5 inches to the mile; the depth along this line during the flood of 1878 was, on an average, over 10 feet, and the width of the flood-surface from 4 to 8 miles.

Supposing the width of a section 20,000 feet, the average depth 6 feet, and the slope 6 inches to the mile, the mean velocity in an ordinary channel would be about $2\frac{1}{2}$ feet per second.

The velocity of the current is, however, checked by the resistance from the tules; but putting it even at 1 foot per second, the discharge would be 120,000 cubic feet per second.

The measured maximum discharge during the flood of 1879 was over 130,000 cubic feet, of which 100,000 was from Putah and Cache Creeks.

During the flood of 1878 it is probable that the maximum discharge was over 150,000 cubic feet per second, more than double the channel discharge of the river at Freepoint.

Putah and Cache Creeks rise and fall very rapidly, but one day of maximum discharge would be equivalent to an average discharge of 10,000 cubic feet for ten days.

The duration of floods in the river is so great that the crevasse discharge may continue approximately uniform for a sufficient period to fill the basin thrice over.

From these figures some idea may be formed of the immense mass of flood-waters poured through Cache Slough across the channel of the river.

Should this outlet be closed, the capacity of a drainage canal which will divert into Suisun Bay the waters of Putah and Cache Creeks, and the surplus waters of the river, under the present system of levees, must, in my opinion, far exceed 20,000 cubic feet per second.

It may be suggested that a moderate canal discharge would, at least, drain the waters of the basin so that crops might be put in within ninety or one hundred days after the time of high water.

Supposing, for instance, the basin filled to the flood-height of 1878, a canal discharge of 5,600 cubic feet per second would drain off the waters in about one hundred days.

Such discharge would not, however, prevent, even during ordinary floods, the filling of the basin, the destruction of the river levees, and the inflow of the river waters, in which case the subsidence of the waters within the basin would depend on the subsidence of the waters of the river.

COST AND DIMENSIONS OF A CANAL FOR DIFFERENT DISCHARGES.

It is proposed to cut the bed of the canal to the level of ordinary high tide at Denverton, at the head of Suisun Bay. This level is but 10 feet below the flood-height of the waters of the basin during the flood of 1878, and 8½ feet below the flood-height of the river at the mouth of Cache Slough, and in order that the water at the entrance to the canal may not rise to within 1½ feet of the flood-height of the river in 1878, the depth of water in the channel cannot exceed 7 feet.

The distance through the cut from the northern base of the Montezuma Hills to the tules of Suisun Bay, at the level of ordinary high tide, is about 7 miles, and even assuming that the current would ultimately cut the bed so that the water-surface would fall to the high tide level at Denverton, the slope could not exceed 1 foot to the mile. With this slope, a depth of 7 feet and a width of bed of 200 feet, the discharge would be about 5,000 cubic feet per second.

The amount of excavation, as shown in the detailed calculations accompanying this report, would be 4,630,000 cubic yards, and the cost, at 25 cents per yard, \$1,157,500.

A canal with a bed of 1,000 feet, under the same conditons, would discharge about 23,000 cubic feet per second, and would cost \$5,335,000.

This would not include the right of way, or the levees at and beyond Denverton, or the auxiliary works and canals for conducting the waters from the basin to the entrance of the canal, and including these items, and also the cost of supervision and contingencies, the cost of a canal with a maximum capacity of 23,000 cubic feet per second would not be less than \$6,000,000.

These calculations assume the depth of water in the channel at 7 feet, but with a depth of 4 feet the discharge for a width of 1,000 feet would be about 10,000 cubic feet per second.

Should a levee system be perfected which would afford a reasonable security against overflow, it would be possible to drain the waters of Putah and Cache Creeks into Suisun Bay by means of a canal of moderate dimensions, but its construction would not be advisable under present circumstances. The construction of a drainage canal of sufficient capacity to divert into Suisun Bay the waters now discharged during floods through Cache Slough across the channel of the Sacramento would, in my opinion, be of great benefit to the river, above and below; would protect the levees of the island between the Sacramento and the San Joaquin, and would reclaim a large portion of the lands within the tule basin on the west of the river.

The work would, however, on account of the heavy cutting, the limited depth of water, and the great width of the channel necessary in order to secure the requisite capacity of discharge, be of such magnitude and cost, that it could be executed only as a part of a general plan and in connection with, and subsequent to, a system of levees affording a reasonable security against inundation, at least during ordinary floods.

Respectfully submitted,

ISAAC W. SMITH,
Chief Engineer Sacramento River Drainage District.

REPORT OF THE ENGINEER IN CHARGE.

As Engineer in Charge of the work done by the Sacramento River Drainage District, under an Act of the Legislature, entitled "An Act to create a Drainage District, to be called the Sacramento River Drainage District, to establish a Board of Commissioners therefor, and to define their power and duties," approved April 1st, 1878, I herewith submit the following report of such work, with field-notes, maps and estimates of the cost of construction of the work proposed by the above bill.

Under Section 8 of this Act a party was organized, numbering thirteen, with Messrs. William Bassett, of Sacramento, and Horace D. Gates, of San Francisco, as Chief Assistants, and placed under my charge on the 1st day of June, 1878, for the purpose of making the surveys necessary to determine the practicability of the improvements contemplated in this Act, to wit: draining the surplus waters of the Sacramento River, and waters flowing from the east side of the Coast Range of Mountains, in the Counties of Yolo and Solano, into Suisun Bay, at a point removed from the present mouth of the Sacramento River, by making a cut through the Montezuma Hills.

The first camp was made at Denverton, Solano County, where, after a little time spent in disciplining the party, work was commenced, and a line run from a point on and near the head of Nurse Slough as the initial point, southerly across the tule lands to the end of the Potrero Hills, and thence skirting the edge of the hills to Montezuma Slough, which was found to be of large carrying capacity, being of an average width of 1,000 feet, and from 30 to 40 feet in depth, and of a comparatively direct course to the deep waters of Suisun Bay, near the head of the Straits of Carquinez.

The object of this line was to ascertain the practicability and the probable cost of taking a canal into this part of the bay. Offset and auxiliary lines were run in order to locate the numerous sloughs, with a view of selecting the most favorable route.

The line was mainly over wet tule land and narrow, deep sloughs, or so-called beaver cuts; the length with offset and auxiliary lines is $8\frac{2}{10}$ miles. The length of main line $4\frac{8.8}{100}$ miles, to the intersection with Montezuma Slough, and from this point to Suisun Bay, $6\frac{6.5}{100}$ miles. This line is denoted as "A" line in the note-books.

The line was next taken up at the initial point heretofore mentioned, and a base line run across the divide known as the Montezuma Hills, from the head of Nurse Slough to the head of the south fork of Lindsey Slough.

Contour lines were run both ways from the "base line" on the Nurse Slough side, and also on the Lindsey Slough, and offset lines were run each way from the summit, the object being to determine the lowest and shortest practicable route over this divide. Considerable time was devoted to this work, and an aggregate length of $63\frac{6.5}{100}$ miles of contour and offset lines were run, which resulted in the

location of the line shown on Plate No. 3, in connection with the contours, as the most practicable route for a canal. Subsequently a series of wells were bored on this line across the divide, 1,000 feet apart, to determine the material composing this portion of the Montezuma Hills. An accurate account was kept by one of the party detailed for this work, and samples taken of every change of stratum found in boring. The wells number thirty-one, aggregating in depth $536\frac{1}{2}$ feet. The results of such borings are shown in detail on Plate No. 5, and in section on Plate No. 3, and the location of a portion where rock was found, on Plate No. 4.

The only rock found was on the westerly slope of the hills, and is a soft sandstone, offering little resistance to making the cut. The other portions of the hills were found to be composed principally of clayey soils, with some gravel and quicksand.

Of the contour lines run, the first, or one of the least elevation, on the west side of the divide, is 10 feet above low tide datum line at Denverton, the one on the east, or Lindsey Slough side, being 15 feet above low tide or datum line at Denverton, each successive one at 5 feet greater elevation, up to 30 feet, the next one being 37 feet above low tide, the next one 40 feet, and so on up to 90 feet, the greatest elevation on the line adopted for the route of the canal being 37 feet above datum, or about 30 feet above ordinary high tide at Denverton. This located line is denoted as B line in the note books. It is perhaps well to remark that on this as well as much of the subsequent work, the party was greatly annoyed and the work greatly impeded by the gnats, which on still days swarmed in countless myriads from the cracks in the adobe, attacking all the exposed parts with their venomous bite, the effects of which often remained for weeks.

In connection with this line across the divide, an auxiliary line was run along the northern base of the Potrero Hills, connecting with Suisun Bay by the way of Suisun Slough. This line is denoted as Z line in the note-books, and is, with the continuation of the line into Fairfield, 9 miles in length. A line was also run over the first pass to the east of Denverton, but on attaining an elevation of 97 feet above low tide it was abandoned. The length of this line was $2\frac{1}{10}$ miles, and is denoted as C line in the note books.

The located line across the divide was then taken up, and extended northerly toward Gray's Bend, following as nearly as practicable the natural grade line of the country, rising at the rate of 6 inches to the mile. Offset lines were run each way from this line at different points, in order to determine the slope of the ground from west to east. At the sink of Putah Creek back-water from the tule was met with, and a detour made to avoid it; an offset line was run around the overflowed district, the line being again taken up on the opposite side, at a point at or near Swingle's Station, on the California Pacific Railroad, and continued. Back-water was again met with on reaching the tule directly south of Gray's Bend and east of the sink of Cache Creek, and a second detour made, crossing Cache Creek above the sink and running into Knight's Landing, thence down the Sacramento River to Gray's Bend.

From Gray's Bend a line was run back towards the point on the other side of the tule, where the back-water was met, a distance of $\frac{8}{10}$ miles, as far as the water permitted.

High water at Knight's Landing was found to be $41\frac{5}{10}$ feet above low tide at Denverton, and at Gray's Bend 39 feet above low tide.

The total length of this line, including offset lines, is $77\frac{33}{100}$ miles. The length of main line, not including offset or auxiliary lines, is $44\frac{36}{100}$ miles. The object of this line being to determine the amount of fall from high water in the Sacramento River, at Gray's Bend and Knight's Landing, to low tide at Suisun Bay, and also to determine the most practicable route for a canal, diverting a portion of the waters of the Sacramento River at or near Gray's Bend, and intercepting the waters of Cache and Putah Creeks and other waters coming in from the west before they have entered the tule basin, and keeping on the high land, reach the Montezuma Hills at a point with as great an elevation as can be attained, after allowing grade enough to give velocity to the waters of the canal.

A meander line, having its initial point at Gray's Bend, was next run down the west bank of the Sacramento River, with offset lines running into the tule on the west, and frequent cross sections of the river banks, with measurements of the width of the river, to Rio Vista; connection was made with Sacramento City and with a series of gauges put up by the State Engineer Department. This work was done in connection with that of the State Engineer Department. Permanent benches and points were established at intervals of 1 mile as a base for future operations. Mr. D. D. Griffiths, of the State Engineer Department, accompanied this survey as topographer. The survey was greatly impeded by the difficulty of working through the dense thickets of brush bordering the banks of the river, and by continued sickness in the party, caused by the intense heat and the malaria; also from the effects of the poison oak which here abounds.

The total length of this line, including offsets and cross sections, is $98\frac{98}{100}$ miles, the length of the offset and cross section lines being $32\frac{47}{100}$ miles. This line is denoted as No. 10 in the note-books.

The object of this survey was to gather data to determine the effect upon the river by diverting a portion of its waters by means of a canal into Suisun Bay, and to determine the amount necessary to be so diverted in order to produce a certain diminution of the volume of the waters of the river at all points below the point of diversion, and to obtain a correct alignment of the Sacramento River.

From a point near Rio Vista a tie line was run across to and connected with the "B" line. The length of this line was $9\frac{41}{100}$ miles.

A survey of Putah Creek was then made, a line being run from the sink of the north branch or old channel of the creek, up the creek to a point on the Rancho Rio de las Putos, near Green McMahon's residence, said point being above the line of overflow from the creek, where a section of the creek was prepared for gauging during the next high water in the creek. A line was then run down the south branch or new channel of Putah Creek to the tule, with numerous offset and cross section lines. The total lengths of these lines are $31\frac{71}{100}$ miles, and are denoted in the note-books as Putah Creek surveys, and shown on Plate No. 6.

The object of this survey was to determine the maximum volume of water entering the tule basin from this source during the flood season, the most practicable route for taking it into a main canal, and an estimate of the amount of debris brought down and deposited in the tule.

A survey with the same object in view was made of Cache Creek. Total length of line, including cross sections, $9\frac{1}{100}$ miles, is denoted in note-books as Cache Creek surveys, and shown on Plate No. 7.

A series of lines were run into and across the tule from different points on the "B" line, viz.: one into the Big Lake Basin $4\frac{5.3}{100}$ miles in length; one across the tule at its narrowest point, where the old Williams' grade crossed at the head of Babel's Slough, $7\frac{7}{100}$ miles in length, and one running down Cache Slough $3\frac{6}{100}$ miles in length. These lines are shown on Plate No. 1, and profiles of same are shown on Plate No. 2.

This finished the work in the field, and the party was disbanded November 5th, 1878. On the 1st of October, Horace D. Gates severed his connection with the party to accept a position on the Government survey, the vacancy being filled by Norman B. Kellogg, of San Francisco.

Subsequently a line of levels was run from Rio Vista to Denver-ton, thence to Lindsey Slough, and thence to Cache Slough, putting up and connecting gauges at these points.

Upon finishing the work in the field, an office was established at 53 J Street, Sacramento, and the work of making maps of the surveys, with plans for the work proposed, and estimates of the cost of same, was commenced, William Bassett, of Sacramento, being Chief Assistant.

A general map of the district was made on a scale of 14,000 feet to 1 inch, and a map of the profiles of the surveys, Plate No. 2, for publication. The general map or maps of the Sacramento River Drainage District surveys shows the boundaries of the district, the sections within the district only being numbered; the Montezuma Hills, the Sacramento River, the tule basin, the line of a *proposed* main canal from Knight's Landing to Suisun Bay, the proposed subsidiary canals, the line of lowest levels through the tule from Gray's Bend to the Montezuma Hills, in connection with a drainage cut through those hills, the lines D, E, F, and B L, run into and across the tule basin, with the main points of interest.

Plate No. 2.—Profiles of surveys of Sacramento River Drainage District, shows a profile of the line of a proposed main canal, a profile of lowest line of levels through the tule, a profile of the bank and bed of Cache Creek, a profile of the bank and bed of Putah Creek, a profile of the bank and bed of the new channel of Putah Creek, a cross section of the tule basin at line "D" on the general map. (The notes of this cross section were obtained from the State Engineer Department.)

A cross section of the tule basin at line "E" on the general map, the notes of which were obtained from the Engineer Department of the Central Pacific Railroad; a profile of the line "B L" shown on the general map, and a cross section of the narrowest part of the tule basin at line "F," also on the general map.

Plate No. 3.—A map of the contours of Montezuma Hills, scale 1,000 feet to 1 inch, showing the contours run to determine the lowest pass over this divide. The located "B" line as being the most practicable route for a canal.

The line across the tules from the head of Nurse Slough to Montezuma Slough, the location of Denver-ton, the high land of the Potrero Hills, Lindsey, Nurse, and Montezuma Sloughs, a profile of the "B" line showing the shape of the divide, and a section showing the strata in connection with a profile of a drainage cut through the hills.

Plate No. 4.—Showing the location of the sandstone ridge on the

westerly slope of the divide near Denverton and the wells bored to ascertain the extent and depth below the surface of said ridge.

Plate No. 5.—A profile of "B" line across the divide, showing the wells bored and the results of such borings in detail, and the grade lines of the proposed main canal and of a drainage cut respectively.

Plate No. 6.—Map of Putah Creek surveys, scale 1,000 feet to an inch, showing the surveys in detail. Two cross sections, one of the old and one of the new channels, showing their relative carrying capacities. Two cross sections taken above the line of overflow to assist in determining the volume of flow. A profile of the bank and bed of the creek from a point above the line of overflow down the old channel to the tule, and of the new channel from its head to the tule, and showing the Putah Creek subsidiary canal, and its junction with the proposed main canal.

Plate No. 7.—Map of the Cache Creek surveys, scale 1,000 feet to the inch, showing the surveys in detail, with two cross sections taken at points above the line of overflow to assist in determining the volume of flow. A profile of the bank and bed of the creek from a point above the line of overflow to the tule, the Cache Creek subsidiary canal and its junction with the proposed main canal, and the location of Gray's Bend on the Sacramento River, in its relation to the sink of Cache Creek.

Under the direction of Chief Engineer Isaac W. Smith, a proposed line for a main canal was adopted, having its initial point at Knight's Landing, 8 feet below the high water of 1878, and running thence, following as nearly as practicable the natural surface slope of the ground, with a grade falling at the rate of 4 inches to the mile, to the Montezuma Hills, reaching them at a point with an elevation of $19\frac{7}{10}$ feet above low tide, thence through the hills with an increased grade of 6 inches to the mile $3\frac{1\frac{9}{10}}{10}$ miles to the ledge of rock aforementioned, an overfall being made at this point of 10 feet, and thence continuing said grade to a point in the tule south and west of Denverton, when the grade runs out on the surface of the tule; thence with a grade conforming with and to the surface of the tule to Montezuma Slough.

This line for a proposed main canal is shown on the general map of the district, and a profile of same on Plate No. 2.

Estimates were made of the amount of earth-work necessary to construct this canal, based on the following cut and levees:

Beginning at the Sacramento River, at the Town of Knight's Landing, with a cut — feet wide on the bottom, with side slopes of 1 to 1, and following along the line shown on the general map with a grade 8 feet below high water of 1878 at point of beginning, and falling at the rate of 4 inches to the mile, $\frac{8\frac{5}{10}}{10}$ miles, to where the grade of the bottom of the cut runs on the natural surface of the ground. Levees are built on each side of this cut, beginning at Knight's Landing and running thence parallel, with a width on top of 5 feet, with an inside slope of 3 to 1, and an outside slope of 2 to 1, with a grade on top conforming with and 9 feet above the grade of the bottom of the canal, along said line shown on general map, $7\frac{3\frac{0}{10}}{10}$ miles to the junction with the Cache Creek subsidiary canal, as shown on general map, also on Plate No. 7. At the point of junction the main canal is widened, by placing the levees a greater distance apart, to a width of — feet, and continued thence, with the same relative grade, $14\frac{5\frac{4}{10}}{10}$ miles, to the junction with Putah Creek

subsidiary canal, as shown on the general map, and also on Plate No. 6. At the point of junction the width of the canal is again increased in proportion to the amount of increase in the volume of water to be carried.

Continuing thence, with the same relative grades, $20\frac{4.9}{100}$ miles, to where the grade of the top of the levee runs out on the natural surface of the ground at the Montezuma Hills. The canal is continued through the hills by means of a cut 600 feet wide on the bottom, with side slopes of 1 to 1, beginning back $\frac{4.6}{100}$ of a mile from the end of the levees and running thence, with an increased grade of 6 inches to the mile, $3\frac{1.9}{100}$ miles, to where the overfall is made.

Continuing thence $1\frac{4.2}{100}$ miles to where the grade runs out on the surface of the tule, the canal is carried across this tule land by means of two parallel levees, beginning back $1\frac{1.4}{100}$ miles from the end of the cutting, and running thence with a grade conforming with the surface of the tule $5\frac{5.6}{100}$ miles to a junction with Montezuma Slough. The total length of this proposed main canal, from Knight's Landing to Montezuma Slough, is $50\frac{4.1}{100}$ miles.

The Cache Creek subsidiary canal, for the purpose of diverting the waters of Cache Creek into the main canal, begins at a point where the Northern Railway crosses the creek, near the Town of Yolo, said point being above the line of overflow of the creek, and running thence down the present channel, utilized by means of levees on either side, with a width of 5 feet on top, with an inside slope of 3 to 1, and an outside slope of 2 to 1, and with a grade conforming to the fall of the bed of the creek $4\frac{5.5}{100}$ miles, to where the waters are diverted into a cut 150 feet wide on the bottom, with side slopes of 2 to 1, with levee of similar dimension to the foregoing on each side; running thence, with a curvature of 5,730 feet radius $2\frac{5.8}{100}$ miles, to a junction with the main canal, shown on general map and also on Plate No. 7.

The Putah Creek subsidiary canal, for the purpose of diverting the waters of Putah Creek into the main canal, begins at a point on the creek above the line of overflow of the waters of the creek, said point being located on the creek 2,900 feet above the residence of Green McMahon, and running thence down the present channel, utilized by means of levees on either side of said channel, with a width on top of 5 feet, with an inside slope of 3 to 1, and an outside slope of 2 to 1, $5\frac{3.1}{100}$ miles to the forks of the new and old channels, thence down the new channel, and by line shown on the general map, and also on Plate 6, $7\frac{7.0}{100}$ miles to a junction with the main canal. The total length of this subsidiary canal is $12\frac{2.8}{100}$ miles. These estimates are hereunto appended.

An estimate was also made of a drainage cut through the Montezuma Hills, from Lindsey Slough to the tule a little south and west of Denverton, the bottom of this cut to be 200 feet in width, with slopes of 1 to 1, having a uniform elevation of $6\frac{5}{100}$ feet above low tide; the average elevation of high tide is also hereunto appended. The length of this cut would be $7\frac{2.0}{100}$ miles. A profile of the cut is shown on Plate No. 2, in connection with that along the line of lowest levels through the tule; also on Plate No. 3, in connection with a section showing strata of Montezuma Hills, the alignment being shown on general map.

On Plates Nos. 6 and 7 is shown the highest water mark of 4th and 5th of March, 1879, with the cross sectional area of Cache and Putah

Creeks, respectively. Observation of the velocity of the current of Putah Creek was made in company with Mr. Bassett on the 5th of March, which resulted in a mean surface velocity of $12\frac{8}{10}$ feet per second, with a depth of $24\frac{7}{10}$, the water falling at the rate of 1 foot per hour.

The hight of the highest water was noted, being $5\frac{1}{10}$ feet in excess of the observed hight, which would give a maximum depth of $30\frac{5}{10}$ feet. A comparison was made between the observed velocity in feet per second, and that obtained by formula—

$$\frac{\sqrt{\frac{A}{F \times l p}}}{2gh} = V$$

A being the main area of cross section, l=length of observed section p=perimeter, h=fall in bed of creek, F=co-efficient of friction, g=velocity acquired by falling bodies at the end of the first second, V=mean velocity in feet per second, the result being by observation $12\frac{8}{10}$ feet per second for a mean surface velocity, and $12\frac{8}{10}$ feet $\times \frac{8.5}{10}$ gives $10\frac{9}{10}$ feet, this for a mean velocity of the whole cross section per second. By formula a mean velocity of the whole cross section of $12\frac{3}{10}$ feet was obtained, which, under reversed circumstances, that is to say, with the creek rising instead of falling, I assume to be approximately correct.

Then using this formula with a depth of water of $30\frac{5}{10}$ feet, a cross sectional area (A) of 5,751 feet, length of section (l) 1,000 feet, a perimeter or water profile (p) of 274 feet, a fall (h) of 1 foot, $g = 32.166$ feet, and $F = .00743$, $V = 13.48$, the mean velocity in feet per second of the entire area of the creek, and the area $5,751 \times 13\frac{4}{10}$ mean velocity, gives 77,523 cubic feet per second as the maximum volume of flow.

An observation of Cache Creek other than noting the hight of highest water, was not made, the similarity of the two creeks making an observation of both not essential for the purpose of this report, as only an approximation is aimed at. High water of March 5th, 1879, gives a mean depth of $23\frac{1}{10}$ feet in the section taken of the creek, which gives a mean area of 3,558 feet, a perimeter of 235 feet, fall of 1 foot, length 1,000 feet, and by preceding formula a mean velocity of $11\frac{4}{10}$ feet per second is obtained, and $11.41 \times 35\frac{5}{10}$ gives 40,596 cubic feet per second as the maximum volume of flow.

There is appended hereunto tables showing the total mileage of the surveys, the total number of acres in the district, as computed from surveys on file in the Surveyor-General's office, and the relative hights of the main points in the district.

Respectfully submitted,

JIM. C. PIERSON,
Engineer in Charge.

TABLE

Showing the total length in miles of the various lines constituting the Sacramento River Drainage District surveys.

Main line	132.14 miles.
Offset and tie	107.00 miles.
Cross section	11.57 miles.
Contour	57.22 miles.
Putah Creek	31.62 miles.
Cache Creek	9.00 miles.
Total	348.55 miles.

TABLE

Showing the number of acres in the Sacramento River Drainage District.

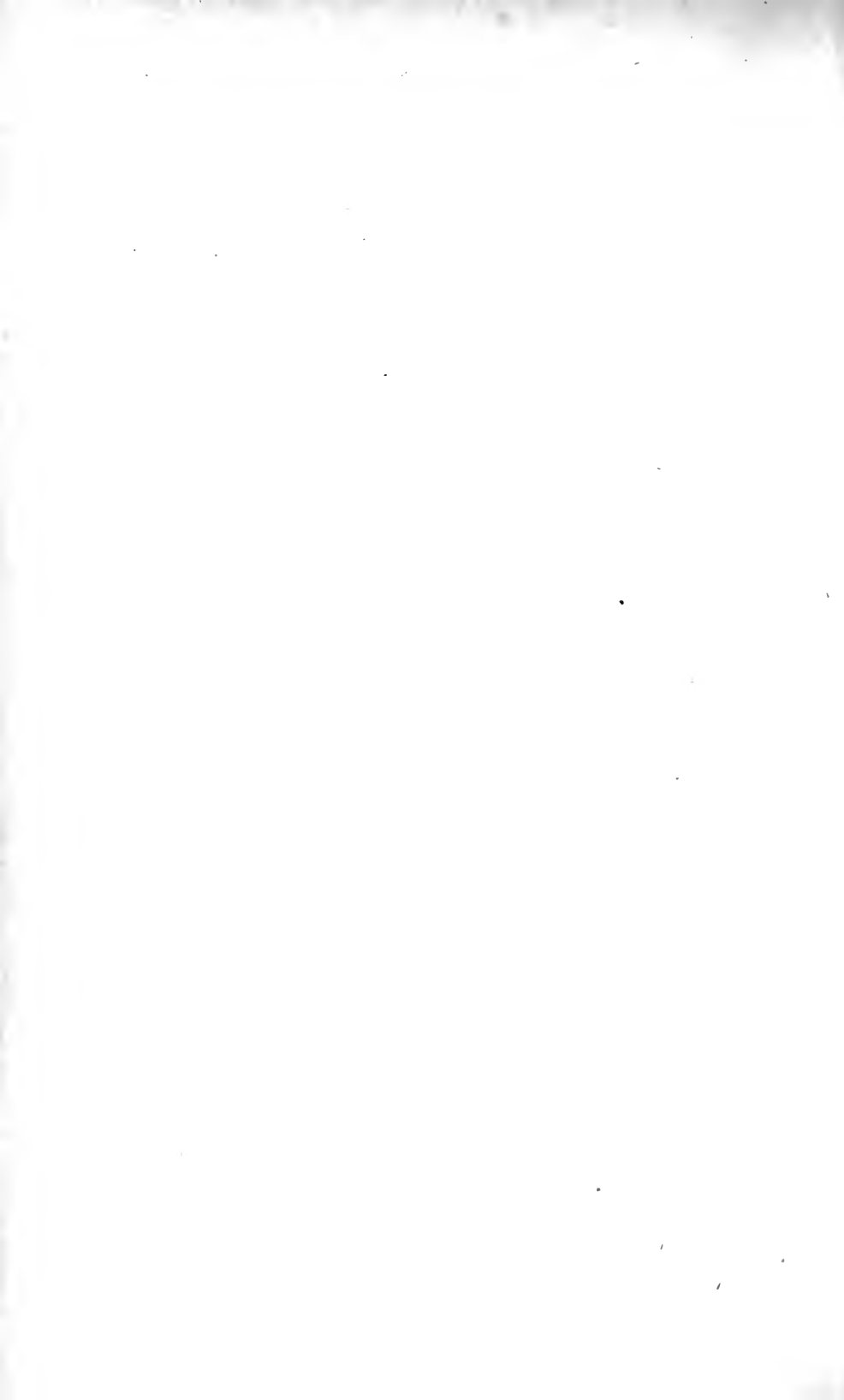
Sacramento County	166,121.80 acres.
Solano County	49,281.36 acres.
Yolo County	147,065.32 acres.
Total	362,468.48 acres.

TABLE

Showing the relative elevation of principal points in the Sacramento River Drainage District.

Low tide at New York Landing (Hall's base)	1.26 feet.
Low tide at Denverton	0.00 feet.
High tide at Denverton (average)	6.50 feet.
High tide at Denverton (extreme)	10.00 feet.
Surface of tule from Denverton to Montezuma Slough (average)	6.50 feet.
Surface of tule at Lindsey Slough	6.50 feet.
Surface of tule at Big Lake	3.00 feet.
Surface of tule at its narrowest point (opposite Babel Slough)	9.00 feet.
Surface of tule at the sink of the new channel of Putah Creek	12.30 feet.
Surface of tule at the sink of the old channel of Putah Creek	26.00 feet.
Surface of tule opposite Sacramento	11.50 feet.
Surface of tule opposite Colonel Hall's	20.00 feet.
Surface of tule opposite Gray's Bend	26.66 feet.
Surface of tule at sink of Cache Creek	27.50 feet.
Summit of pass over the Montezuma Hills	37.08 feet.
Surface of ground at Maine Prairie	8.00 feet.
Surface of ground at Knight's Landing	37.10 feet.
Surface of ground at Gray's Bend	34.60 feet.
City base, Sacramento	4.96 feet.
Flood-height of water at Maine Prairie, 1861 and 1862, 18.02; of 1878	16.70 feet.
Flood-height of Sacramento River at Newtown Landing, of 1878	16.24 feet.
Flood-height of Sacramento River at Richland	20.45 feet.
Flood-height of Sacramento River at Babel Slough	24.26 feet.
Flood-height of Sacramento River at the cheery ranch	27.97 feet.
Flood-height of Sacramento River at Sacramento	30.92 feet.
Flood-height of Sacramento River 10 $\frac{1}{2}$ miles below Freeport	32.05 feet.
Flood-height of Sacramento River 2 $\frac{1}{2}$ miles below Fremont	33.58 feet.
Flood-height of Sacramento River at Gray's Bend	37.00 feet.
Flood-height of Sacramento River at Knight's Landing	41.50 feet.
Flood-height of Cache Creek at Yolo	88.00 feet.
Flood-height of Putah Creek at Green McMahon's	100.76 feet.





UNIVERSITY OF CALIFORNIA,
COLLEGE OF AGRICULTURE.

SUPPLEMENT

TO THE

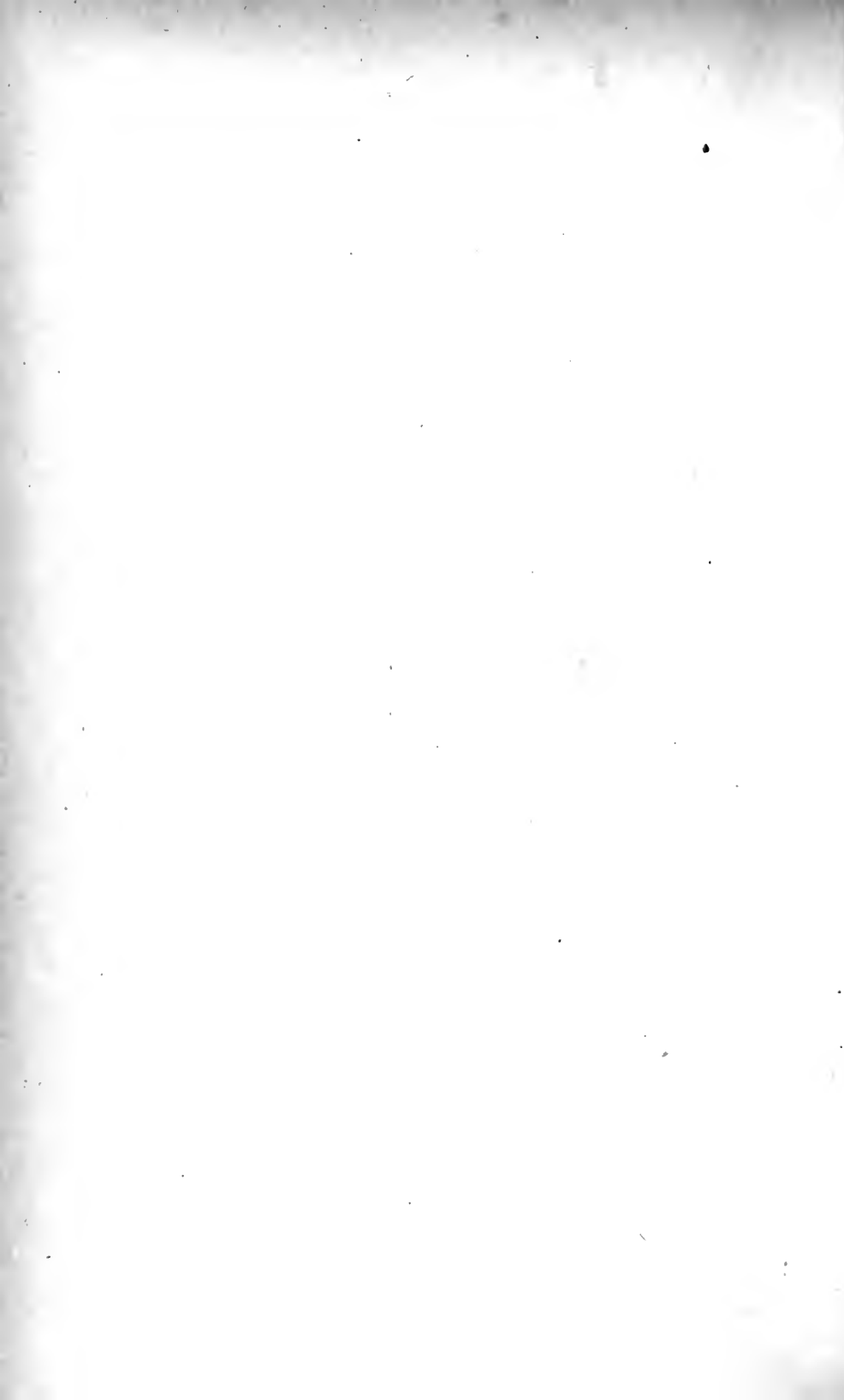
BIENNIAL REPORT OF THE BOARD OF REGENTS.



REPORT OF THE PROFESSOR OF AGRICULTURE

TO THE

PRESIDENT OF THE UNIVERSITY.



REPORT OF PROFESSOR E. W. HILGARD.

To the President of the University:

I herewith respectfully submit a report of the operations of my department for the past two years.

As regards the course of instruction, it has, since my last report was made, been materially expanded, and rendered more thorough and more interesting to the classes, by the aid of the appropriation of \$5,000 a year for two years, made at the last session of the Legislature. As a consequence, the number of students attending the properly agricultural courses has increased, until, with an average attendance of twenty to twenty-five (besides the students of other scientific courses attending the course of general botany), its numbers are more nearly on a level with those of the other courses; albeit, so far, there are many who do not pursue the course to graduation, but attend only such parts as they specially desire. A regular increase of graduates, however, is also apparent. In 1878-9 there was one; in 1879-80 there will be three; in 1880-81 there will probably be five or six. It is true that these numbers are still very small as compared with the predominance of agriculture as a pursuit among the population of the State. Here as elsewhere, we may expect this apparent anomaly to disappear whenever the soil shall fail to yield, as it now does, abundant returns to even the rudest culture, just as, at the outset, the gulches and placer mines of the Sierra yielded its treasures as freely to the rude search of the prospector as to the professional miner. The soil, fortunately for mankind, is more long-suffering than the mines; and while the placer miner has long been driven back to the outskirts of civilization, the pioneer farmer still holds his own, and is slow to appreciate the fact that agriculture, like mining, metallurgy, engineering, or medicine, has a definite scientific basis, the knowledge of which, with the diligent use of trained intellect, will insure permanent success to the greatest possible extent, under any circumstances and anywhere. Our large wheat growers are now picking up the big nuggets from their soil very rapidly; and the time is fast approaching when, like the placer miners, they will either have to retire to the outskirts of culture, or, preferably, to consider seriously the question of maintaining the fertility of their lands, by husbanding their resources before exhaustion compels a costly process of resuscitation. To determine the best and most feasible modes of accomplishing this in the various sections of the country, and to diffuse a knowledge of the results of the best experience of the past, I consider as being at this time the most direct mode of benefiting agriculture in the United States; and the rapidly increasing number of agricultural experiment stations, as well as the greater attention given to this part of their task by the established agricultural colleges, is to me a most hopeful indication of progress; for it is a sure

sign that the farmers themselves are fast coming to the conclusion that it is on the increased use of "brain rather than brawn" that their future prosperity must be based.

In conformity with these views, as well as with the demand for instruction in the details of the several cultures (which could not be given by myself in addition to other indispensable duties), the intent of the appropriation has been carried out by additions and improvements substantially as follows:

LECTURES ON PRACTICAL AGRICULTURE.

1. The appointment of lecturers on practical agriculture, i. e., on the details of the several branches of agricultural practice.

It is a matter of record and remark in the history of the agricultural colleges everywhere, that the place of teachers of practical agriculture is the most difficult to provide for satisfactorily. For manifestly, it is not enough that a person should be acquainted with local practice, since instruction must be of a general and comprehensive character, not biased by local or personal habits or preferences. With this already rare acquaintance with a comprehensive practice, must be combined a knowledge of the scientific principles upon which such practice is based; therefore, quite a thorough acquaintance with a wide range of natural sciences, and including history and political economy. The possessor of all these qualifications must, moreover, be able to impart his knowledge to others in a clear and logical manner; to which, in this country, is generally added, on the part of students, the requirement that he be a fluent and agreeable speaker.

It is obvious at a glance, that so long as men are not specially educated with a view to this combination of qualities, their joint possession must be a rare accident; and, as is actually the case, their possessors are few and far between. Recourse must, as a rule, be had to specialists as the most feasible mode of procuring practically useful instruction. This is comparatively easy in the East, but the remoteness of California, as well as its climatic and, therefore, agricultural peculiarities, greatly restricts our choice in this respect.

We have, however, found in Mr. C. H. Dwinelle (who has been acting as Lecturer on special cultures during the past and present sessions) a gentleman combining a considerable farming experience in California, with a fine general education, and the special qualifications acquired in a course of study under Professor S. W. Johnson, of the Yale Scientific School, of which he is a graduate. In addition to tri-weekly lectures to the Senior Class, Mr. Dwinelle has, during the present year, taken general charge of the field cultures on the experimental grounds, as well as of much of the correspondence relating to such matters: all of which has heretofore devolved upon myself alone, in addition to a full complement of class duties. The needful complement to the agricultural course, heretofore deficient, has thus been secured; and besides, greater efficiency in the experimental portion of the work, and the possibility of fulfilling more adequately the needful condition of practical demonstration, by excursions to ranches where particular branches of agriculture are pursued with marked success. Mr. Dwinelle's report on these subjects forms part of the appendix herewith transmitted.

For reasons already referred to, and obvious in themselves, it is

thought desirable to obtain, whenever possible, the services of specialists for instruction, especially in the more strictly technical branches of agricultural practice; the more vivid and thorough presentation of the subject thus secured being acknowledgedly of great importance to the student. The first lecture of this kind was, on invitation, delivered before the students of the agricultural course and a numerous audience, by Doctor A. De Tavel, Veterinary Surgeon, of San Francisco, on the subject of "Glanders;" this dangerous disease being, at the time, the subject of considerable comment and uneasiness on the part of the farming population as well as the community at large. Doctor De Tavel's lecture was the more interesting, as it was accompanied by actual demonstration on the previously prepared head of a glandered horse, which he had procured at considerable pains and expense. It is due to Doctor De Tavel to say that this lecture was given altogether gratuitously.

It was intended that a course on "dairying" should be given at some time during the past session by Mr. E. J. Wickson, the able editor of the Rural Press, who has long made this industry a specialty. Mr. Wickson's engagements at the time prevented the carrying out of the programme. This session, however, this desirable object has been attained by assigning it an early date, and thus a most interesting course of twelve lectures on the principles and practice of dairying, including two class excursions to prominent dairies, has been secured. I trust that the same arrangement may hereafter be made at some convenient time during each session, and that it will be attended not only by University students, but also by others interested in the practice of dairying, which is fast becoming one of the most important branches of agriculture in California. A syllabus of this course forms part of the appendix to this report.

In addition to this essential increase in the scope of instruction, substantial additions have been made to the means of demonstration to classes. Over 600 slides for the magic lantern, illustrating plants of economic importance, insects useful or injurious to the farmer, as well as implements and operations employed in various cultures, have been added to those already on hand; the work of drawing having been done by students standing in need of pecuniary assistance. A standard collection of one hundred varieties of cereals, in the ear, has been procured from Germany and arranged in cases for convenient inspection. The same kinds will be propagated in the garden of economic plants during the coming season, and we expect interesting results from the comparison of the original specimens with those grown for one season under the influence of California soil and climate. Such as prove especially valuable will, of course, be farther propagated for future distribution.

GARDEN OF ECONOMIC PLANTS.

2. The second object that has been kept prominently in view, as an end to be achieved by the aid of the legislative appropriation, has been the continuation and expansion of the experimental cultures on the grounds assigned to the department on the University campus, and the establishment of a garden of economically important plants, both for experiment and for the instruction of classes by actual demonstration and exhibition of the growing plants.

For the latter purpose, a plot of ground of about 1½ acres, lying

adjacent to Strawberry Creek, and to the west entrance to the University, was designated by the Regents, and a competent gardener, to act under my special orders, was employed in the person of Mr. W. G. Klee, at the time a special student in the agricultural course. In the spring of the present year this plot was graded and surrounded with a wire fence, as a protection against stray stock which still continues to be a serious annoyance in other portions of the grounds. It has been subdivided by roads and paths, into plots varying in size from 4x4 feet, for medicinal plants, etc., to 20x30 (for the present) for the large sized field crops, such as corn, sorghum, and the like, subject to farther subdivision, or such other regulation of size or form as may in future be found to be most convenient, the paths and roads being earth only. The lateness of the season at the completion of the grading, and the necessity of procuring from Europe a number of the seeds wanted, has prevented the complete occupation of the plots this year, but the coming season will see them fully planted with a collection of most of the economically interesting plants capable of being grown in the open air in the coast climate. For those not hardy in the open air, one of the three propagating houses has now been definitely assigned to the use of my department, and a small one specially designed for bottom heat has been built at a small cost. Farther accommodation in this direction will, however, soon become indispensable, as the plants, now only seedlings, increase in size. The introduction of heating apparatus, also, has become indispensable for the conservation of these plants, and has been cheaply constructed, under the direction of Mr. Ellis.

One of the vacant students' cottages, not far from the economic garden, has temporarily been assigned as a seed-house, one of the rooms being occupied by the gardener. Unfortunately, it is out of sight of the garden, and, in any case, too far from it to serve as a protection against depredations by visitors, that in some cases have resulted in serious loss, and appear to be on the increase. A suitable building should, as soon as possible, be erected immediately opposite the garden, thus enabling the occupants to watch and protect the latter; while at the same time a great deal of time now lost in carrying tools, etc., to and fro, would be saved. Such building might, at the same time, serve as a "gate-lodge" for the intended main entrance to the University grounds.

More detailed statements will be found in the appendix, and especially in Mr. Dwinelle's report. But I cannot forbear expressing, emphatically, my conviction of the great importance of this portion of the work of the department, and the hope that, under no circumstances, it will hereafter be allowed to drop or languish. Quite apart from the usefulness of this living collection for the purposes of direct instruction to special classes, it serves a most important object in exciting the interest of students, as well as visitors, by presenting to their view one of the most interesting and attractive sides of agricultural science, and that of the most obvious and undeniable practical importance, from whatever point of view it be regarded. For, although the plot occupied by each species of plant is small, yet it subserves the purpose of experiment fully, in so far as it shows which of the kinds cultivated may, or may not, be tried for large-scale culture, with a reasonable prospect of success. It exhibits to-day, in a small way, but in the most emphatic manner, the differences in the ability of different species or varieties of plants to endure drouth—

some of the forage plants, especially, having been cultivated in duplicate plots—one set with, the other without irrigation. As will be apparent from Mr. Dwinelle's report, the experience of a single season has already been fruitful in results on this important question, and we have reason to hope that within one or two years we may thus be able to devise a succession of forage crops adapted to the climate, which will enable the dairyman to maintain a uniform quality of his products throughout the season, without depending on a single crop liable to accidental failure, as is the case with alfalfa.

In the matter of the testing and introduction of new cultures possibly adapted to some of the various climates of California, we labor under the disadvantage of a location in one of the extreme regions. However tempered by distance, and by the proximity of the mountains, the fogs and chilly winds entering the Golden Gate still render it impossible, *e. g.*, to ripen the grape or the fig at Berkeley, in the open ground, or to get a boll of cotton to open in season to be useful as a crop. For such cases as these our only plan is to raise the plants under shelter, as far as possible, and then to distribute them for trial to intelligent persons in the several portions of the State, where it may be presumed that their culture may be successful. In so doing we intend carefully to keep hands off anything that is already in the possession of seedsmen and nurseries, and upon the introduction of any new plant, to cease its distribution so soon as it may fairly be considered as having passed into the category of received varieties, unless it be for purposes of verification of kinds. Our work is, in any case, so wide as to render it undesirable to go beyond the point when experiment ceases and commercial culture begins.

EXPERIMENT STATIONS.

I cannot forbear to urge again, in this connection, the importance of establishing definite experiment stations, cooperating with the agricultural department of the University, in the several different climatic regions of the State. The carrying-out of experiments is proverbially more or less costly, and requires special qualifications on the part of the experimenter if the results are to be reliable. An experimental farm that pays expenses is an impossibility, as has often been shown to the cost of enthusiastic believers in the opposite doctrine. Either the experiments will amount to little or the finances will suffer, though not necessarily to any grievous degree if due judgment is used in the arrangement and scale of the work. Experiment stations must, of necessity, be endowed, like any other institution for the public benefit and instruction, whether by the State or National Government, by bequests of individuals, or by the associated effort of societies. In several cases the latter (individual Granges as well as other agricultural societies), have volunteered to undertake the carrying out of certain kinds of experiments suggested by our investigations, and offers of a similar character from public-spirited persons are not unfrequently received. Unfortunately in many such cases the facilities needed to render an experiment cogent as a proof and fruitful of results are wanting; or the expense of the numerous precautions required in the way of weighing, measuring, and doing all things precisely when and as they should be done for experiments' sake, proves too great for an uncompensated indi-

vidual worker. Yet without such precautions, experiments are too frequently not only useless, but misleading and mischievous in the false hopes they raise.

FIELD CULTURES.

The field cultures on a larger scale, continued during the past three years, have been during the present one restricted to those intended to ascertain the effects of different manures on wheat and oats; while the greater part of the ground has been fallowed, with repeated plowings, for the extermination of weeds, the latter having become so rampant as to render the results of culture almost nugatory. It may become necessary to pursue the same course for another season, the ground having been very deeply and thoroughly seeded, previous to its occupation by me, with weed seeds of the most hardy kinds. The extremely refractory nature of the soil in this, as well the greater part of the rest of the University domain, will always materially restrict and impair the success of experimental cultures on the agricultural grounds until the needed appliances for the control of water—both as to irrigation and drainage—shall be at command.

ORCHARD.

The main portion of the standard orchard having lately also been placed under my control, will now be allowed to bear next season, and its products placed on exhibition at the annual fairs for comparison and identification with the kinds now grown. It will probably appear that many of the well-known varieties have been materially modified by long culture in the California climate. Scions of the verified standards will hereafter be distributed, to persons desiring to receive them, at the proper season.

FOREST TREES.

Considering the subject of forest culture as one of great importance to California, I have endeavored to obtain, by purchase as well as exchange, seeds of as many trees as seemed likely to offer a chance of success in some one of the various climates of the State. A number of these (as shown by the list in the appendix) is now represented by seedlings in the propagating beds; designed partly for distribution to different localities in the State, partly for the representation on the campus of as many as possible of the useful trees of California, as well as of the rest of the world. The varied nature of the University grounds offers locations suitable for a great variety of such economically important trees and shrubs; and as they can be utilized for ornament as well by a skillful landscape gardener, I trust that in the planting of the University grounds, outside of the portion allotted to the agricultural department, this important consideration will be steadily kept in view. It is certainly eminently desirable that the University Park should not only be made attractive in an ornamental point of view, but should simultaneously be made to subserve, as much as possible, the primary objects of the University. This is the more necessary because of the unfavorable nature of the soil in the greater part of the agricultural grounds proper.

A great desideratum still left unprovided for is a Garden of Systematic Botany, which shall embrace, not so much the plants of economic interest, but as full a representation as possible of all the orders of the vegetable kingdom, for the study of botany as a science. Our climate offers exceptional advantages in this respect, there being, probably, no other so peculiarly adapted to the growth, out of doors, of plants from so great a variety of climates. Financial considerations may, for the present, compel the postponement of the establishment of a botanical garden, as being second in importance to that of the economic plants, already in operation. But it will ultimately be as needful an adjunct to the study of botany, as is the chemical laboratory to that of chemistry; and since the culture of a great variety of plants requires the greatest possible advantages of soil and location, I respectfully suggest that the only portions of the campus adapted to the purpose, and not needed for equally or more important educational objects, should not be permanently occupied for other purposes. A few months ago a movement to establish such a garden, in or near the City of San Francisco, was set on foot by the Pharmaceutical Society. But the unfavorable conditions of climate and soil seem to render that peninsula little adapted to such a purpose; it would involve a very heavy outlay in the way of improvements, green-houses, etc., as well as in the maintenance of a staff of employes specially appointed. At Berkeley, on the other hand, not only are the conditions of soil and climate exceptionally favorable for the cultivation of a great variety of plants, with but very moderate accommodations for winter protection of the more delicate, but the most expensive part of the *personnel* needed is already provided for, additional labor being all that would be currently needed beyond the present employes of the University. In addition, a botanical garden established here would be just where it is most needed, and must, at no distant day, be provided, no matter what is done on the other side of the bay; while Berkeley is becoming nearly as accessible to San Franciscans as the outlying portions of the city itself. It is to be hoped that the efforts of all interested will be united towards establishing this desirable adjunct to instruction where it will be most favorably located, both as regards its internal operations and its usefulness; and where such reasonable endowment, as might be readily hoped for from either public aid or private beneficence, would suffice for its maintenance.

WORK IN THE AGRICULTURAL LABORATORY.

The chemical investigation of soils, agricultural products, and other materials of economic importance, has been continued as in former years, and the record of such work is given in the appendix.

By the resignation, about a year ago, of Mr. Frank S. Sutton, up to that time the Chemical Assistant in the analytical laboratory of the department, this branch of the work was for a time stopped, and may practically be considered as having lost about six months time out of the two years covered by the present report. It is at this time progressing very satisfactorily under the hands of Mr. F. W. Morse, who was appointed to succeed Mr. Sutton after an interval of about two months, during which time some unfinished investigations were

carried to completion by Mr. Walter Jones. It should be understood that the analytical operations called for in this position are so varied, and to a great extent of so complex and difficult a nature, that only a comprehensive knowledge of chemistry, and a very considerable amount of special training and experience, can properly qualify an incumbent. Since the salary offered is too small to form an inducement to any one already so qualified, the only thing to be done is to train up promising students to the work, at the cost of a considerable loss of time; the inevitable outcome being, however, that whenever the desirable degree of efficiency is attained by the incumbent, he becomes able, and is soon offered chances, to earn a far better compensation, and the training process has to be begun anew on his successor.

With rapidly increasing demands upon the department for agricultural investigations, it becomes questionable whether the position of Analytical Assistant should longer remain a training school for young chemists, to the serious detriment of work in hand, which could readily occupy constantly two or more additional analysts. If it were pecuniarily feasible to offer a compensation sufficient to retain permanently a competent person in the office, the agricultural laboratory could be made a most valuable adjunct to instruction, as it would afford an opportunity to advanced and post-graduate students to become experts in a great variety of technical investigations, while at the same time the regular work of the examination and classification of the soils of the State (which is now necessarily kept in abeyance by the continuous calls for reports on other subjects of immediate importance) could be steadily kept in progress, thus greatly enlarging both the scope and the quantity of the work done. As an exemplification of the useful investigations which could thus be carried out, I place in the appendix the record of the investigation of the relations of cereal grains to moisture, by Mr. E. O'Neill, a graduate of the College of Agriculture, and now assistant in the chemical department. Other subjects of similarly practical bearings are now in the hands of students of the class of 1880, to be elaborated as graduating theses.

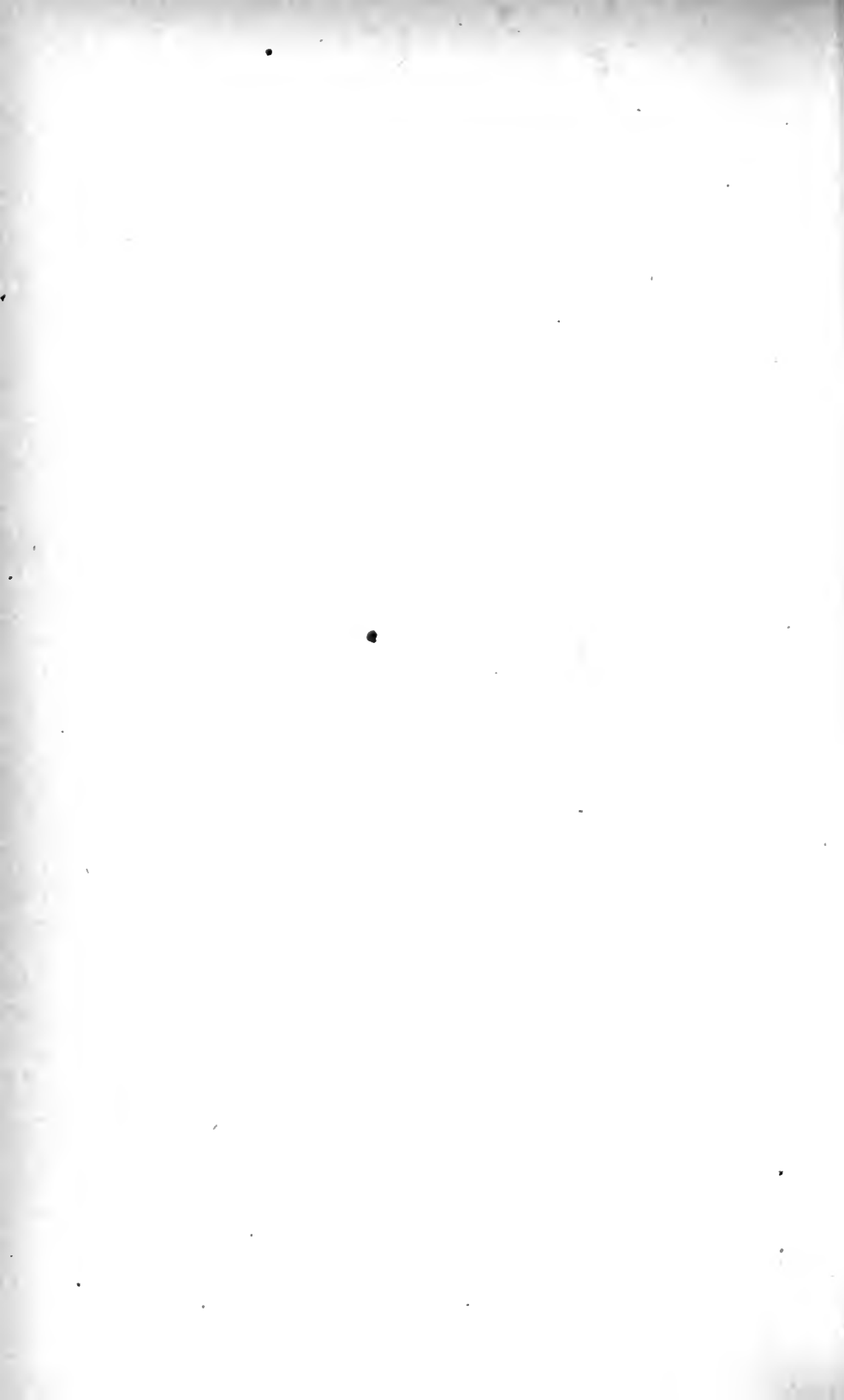
The increasing interest felt by the agricultural population in work of this kind is well exemplified in the varied nature of the investigations asked for, and in the almost overwhelming increase of correspondence. When it is considered that in many cases the replies to such inquiries involve elaborate discussions of data and principles, even when not necessitating laboratory work, it will be readily understood that, superadded to the regular duties of the chair of Agriculture and Botany, they form an overweight which at times it is not easy to carry, and that the response to pressing inquiries cannot always be as prompt as might be desirable. As a proof of the increasing interest in rational and discriminating culture, placed on a more permanent basis than that of the soil-destroying system of pioneer farming, this is a most hopeful feature, and I trust that the substantial services which scientific investigation can thus render to the agricultural interests will also result in the greater appreciation of the benefits which a thorough professional education can confer on the farmers on the future.

In conclusion, I respectfully call your attention to the fact that the maintenance of the advance made in the agricultural department, as above specified, viz., the course of Practical Agriculture, the Garden

of Economic Plants, and the Experimental Cultures, will involve an annual expenditure of at least \$3,000. According to the statement of the Secretary (Annual Report of the Board of Regents for the year ending June 30th, 1879, Appendix F), there remained unexpended at that time out of the \$5,000 of that year's special appropriation, something less than \$1,400. Adding to this sum the \$5,000 of the current year's appropriation, it appears that the improvements in question can be maintained no longer than to the end of the session of 1880-81, even with the utmost economy, if dependent upon that appropriation alone. Unless, therefore, the General Fund of the University can be drawn upon, it would seem to be necessary to make application to the Legislature at its coming session, for a farther appropriation for the purpose of maintaining this important branch of instruction on the level on which it proves measurably satisfactory to those directly interested in agricultural education and progress. I cannot but think that in every point of view, it would be exceedingly unfortunate if, from any cause, the agricultural course should be deprived of the portions bearing most directly upon actual practice, and upon which mainly rests its present usefulness to the agricultural interests of the State.

EUG. W. HILGARD,
Professor of Agriculture and Botany.

UNIVERSITY OF CALIFORNIA, December, 1879.



APPENDIX.

APPENDIX TO THE REPORT OF PROFESSOR E. W. HILGARD.

I.—ANALYSES OF SOILS.

[NOTE.—The following preliminary remarks on the subject of soil analysis are reprinted, with a few changes, from the last biennial report, as necessary to the understanding of the bearings of the soil analysis before reported and discussed. The directions for the taking of soil specimens are also reprinted.]

The fact that plants, in their development, take from the soil certain ingredients which, when returned to it, serve to maintain or increase its fertility; while, if such restoration is omitted, the soil ceases to produce profitable crops; early led to the idea that the chemical analysis of soils ought to give us definite information concerning their productiveness. For some time such analyses were eagerly sought for, and were made in large numbers. But it soon became apparent that, in very many cases, there was no direct relation between the present agricultural value of soils, and the percentage amounts of plant food shown to be contained in them by the ordinary methods of analysis. The consequence was that, for a period of fifteen or twenty years, soil analysis was held by most chemists to be incapable of rendering practically valuable services to agriculture, and was almost abandoned. As usual in such cases, an overestimate led, for a time, to the opposite extreme. It was attempted to explain the complicated processes of plant nutrition under infinitely varied circumstances, without the most elementary knowledge of the soil's peculiarities of composition—an undertaking which, as regards the manufacturers' raw materials, would be deemed absurd in any other technical pursuit.

It has now come to be well understood that while chemical soil analysis cannot, as yet, achieve all that we could desire, yet it is equally true that *without* such knowledge of the soil's prominent peculiarities as chemical analysis can give, we are reduced to mere blind experimenting, so soon as the question arises, *by what means its fertility may be most cheaply maintained or restored*. When analysis has shown the *absence or great scarcity* of certain important soil ingredients, we are at once directed to the addition of these as the first step in improvement. If, on the other hand, an *abundance* of any or all is shown by analysis, we come to the conclusion that the addition of these would probably be a waste of money, and that, if the soil fails to produce, the fault lies either in its physical condition (which must be rectified by tillage, drainage, and the like), or in the fact that the ingredients, though present, are not in an *available* state, so as to be readily absorbed by the roots; and that, therefore, the use of manures, processes, or crops tending to correct this condition, will be the cheapest mode of improvement.

It is obvious that this distinction between the available and unavailable part of the plant food contained in the soil, is of capital importance. If we were able to determine with certainty how much of the sum total of such ingredients, as shown by analysis, is in one

or the other condition, soil analysis would be of the same direct value to the farmer that assaying is to the miner and smelter. Many attempts have been made to arrive at this result, but, until quite lately, with but little success; the difficulty being that the solvents employed by plants in the absorption of food from the soil, and the circumstances under which the process takes place, are most difficult to imitate in the laboratory, even if they were perfectly understood, which as yet is not the case. Then again, different plants differ in this regard; so that a solvent accurately representing the extraction of the soil by *one* kind of plant would not hold rigorously good for another. Moreover, the mechanical or "physical" condition of the soil, its "lightness" and "heaviness," its power of attracting and retaining water or moisture, its relations to drainage and local climate—all these things may affect the agricultural value of a soil quite as much as its chemical composition, and must be known or investigated in order to judge of the soil's capabilities.

In other words, while the knowledge of the soil's chemical composition is *indispensable* to a correct judgment of its general character, best mode of treatment, durability, and cheapest mode of improvement, that knowledge is not nearly *all* that is necessary in order to judge of the soil's practical value. All that is or can be known regarding its mode of occurrence, the experience had in its cultivation, etc., must be brought in for the purpose of throwing light upon the points left in doubt by the chemical analysis. And in order that the latter may be intelligently interpreted, it should in all cases be accompanied by the *mechanical analysis*, which determines *the proportions of clay, and of sand of each different degree of fineness*, which enter into its composition, and upon which the "tillable" qualities of a soil mainly depend. The latter process has only of late been so perfected as to render its results capable of numerically definite expression, bearing a constant and ascertainable relation to the facts observed in actual tillage. Most of the determinations of this kind, made with the implements and in the manner adopted, years ago, by the German experiment stations, are altogether incapable of any definite interpretation, and, as a consequence, have been found of very little practical value in predicting the tilling qualities of soils.

It is hardly necessary to dwell upon the importance of such definite foreknowledge as investigations of this character are now capable of furnishing to the farmer, settler, immigrant, or investor. To these it is of the first importance to know, beforehand, whether the land upon which they settle is likely to "give out" within a few years or not; what is its character as to facility of tillage; how it can most easily be improved in this respect, as well as in relation to productiveness and adaptation to particular crops; and whether the material best adapted to its improvement or the maintenance of its fertility is near at hand and cheaply obtainable, or must be brought from a distance. • On all these, and many other points, analysis, combined with such examination as above detailed, can give categorical information.

It must, however, be borne in mind that a single analysis of a soil in a region not before examined may *sometimes* convey little information of practical value. It is desirable that the general character of and origin of the class of soils to which it belongs be so far known as to allow of a comparison with others of similar character, for it is

only then that the full significance of the data furnished by the analysis can be realized. For the same reason, persons not chemists, or even chemists not familiar with all the facts influencing any particular soil, may often be unable to interpret, usefully, such analysis. In other words, soil analysis, in order to render its best services, must be carried out systematically, on a somewhat comprehensive plan, and not only here and there by individuals. It is, moreover, to be remembered that the names and terms used in the statement of these and other analyses are unavoidably, in the nature of the case, unintelligible to those not to some extent versed in chemical and agriculture science. The new words represent new ideas, which cannot be clothed in the old garments. No one can, therefore, justly complain of the use of "hard words" in this connection, unless, indeed the *practical* results were not stated so as to be intelligible to any one who can read. In addition to these, however, the record of the work must be given, so that those who do understand the subject itself may judge of the reliability of the conclusions reached.

The analyses here given are a part of what is intended to be a systematic series of investigations, covering all the chief varieties of soils occurring in the several agricultural districts of the State, so as to permit of their being mapped out and fully described as regards all the circumstances influencing and determining their agricultural value and special adaptations. With the limited means now at the command of the agricultural department of the University, this must, of course, be the work of time; the more as, in general, precedence must be given to such investigations of agricultural questions as are of most immediate interest to farmers. These, at the present time, relate more usually to products than to the soils, as will be observed in the present record of work. Nevertheless, it is of the greatest interest that as complete a collection as possible of the soils of the State should be obtained at the earliest moment; not only in order that a general idea of their character may be gathered by the University classes, but also because a clue to a great many questions arising in the course of other investigations may be elucidated by even a cursory examination of the soils of the region concerned. A list of such as have already been received or collected is given below for information.

It must not, however, be supposed that the work in question involves anything as absurdly impossible as the analysis of the "soil of every field" in the State. It is well understood by every intelligent farmer, that the soils in his neighborhood, and sometimes those of districts comprising several counties, are readily reducible to a few chief kinds, and their intermixtures. To determine upon and collect fairly representative specimens of these chief kinds is the first step. The analysis of these few will determine their prominent characteristics, and upon this basis those of the intermixtures can also be fixed, with the aid of such further analyses or other examinations as may seem necessary in order to map out correctly their several regions of occurrence. Experience shows that, with little help, farmers will generally be able to distinguish for themselves the local varieties described.

One of the most important points to be known regarding any soil is the kind of subsoil by which it is underlain. This knowledge involves the question as to what extent deep culture with the turning plow may profitably be practiced, and whether an admixture of the

subsoil with the surface soil will be desirable. In many cases, in fact, the analysis of the subsoil is of far greater practical consequence than that of the surface layer.

HOW TO TAKE SOIL SPECIMENS.

In taking soil specimens for examination, the following directions should be carefully observed—always bearing in mind that the analysis of a soil is a long and tedious operation, which cannot be indefinitely repeated.

First—Do not take samples indiscriminately from any locality you may chance to be interested in, but consider what are the two or three chief varieties of soil which, *with their intermixtures*, make up the cultivatable area of your region, and carefully sample these first of all.

Second—As a rule, and whenever possible, take specimens only from spots that have not been cultivated, nor are otherwise likely to have been changed from their original condition of “virgin soils”—*e. g.*, not from ground frequently trodden over, such as roadsides, cattle paths, or small pastures, squirrel holes, stumps, or even the foot of trees, or spots that have been washed by rains or streams, so as to have experienced a noticeable change and not be a fair representative of their kind.

Third—Observe and record carefully the normal vegetation, trees, herbs, grass, etc., of the average land; avoid spots showing unusual growth, whether in kind or quality, as such are likely to have received some animal manure, or other outside addition.

Fourth—Always take specimens from more than one spot judged to be a fair representative of the soil intended to be examined, as an additional guarantee of a fair average.

Fifth—After selecting a proper spot, pull up the plants growing on it, and scrape off the surface lightly with a sharp tool, to remove half decayed vegetable matter not forming part of the soil as yet. Dig a vertical hole, like a post hole, at least twenty inches deep. Scrape the sides clean, so as to see at what depth the change of tint occurs which marks the downward limit of the surface soil, and record it. Take at least half a bushel of the earth above this limit, and on a cloth or paper break it up and mix thoroughly, and put up at least a quart of it in a sack or package for examination. This specimen will ordinarily constitute the “soil.” Should the change of color occur at a less depth than six inches, the fact should be noted, but the specimen taken to that depth nevertheless, since it is the least to which rational culture can be supposed to reach.

In case the difference in the character of a shallow surface soil and its subsoil should be unusually great, as may be the case in tulle or other alluvial lands, or in rocky districts, a separate sample of that surface soil should be taken, besides the one to the depth of six inches.

Specimens of salty or “alkali” soils should, as a rule, be taken only toward the end of the season, when they will contain the maximum amount of the injurious ingredients which it may be necessary to neutralize.

Sixth—Whatever lies beneath the line of change, or below the minimum depth of six inches, will constitute the “subsoil.” But should the change of color occur at a greater depth than twelve

inches, the "soil" specimen should nevertheless be taken to the depth of twelve inches only, which is the limit of ordinary tillage; then another specimen from that depth down to the line of change, and then the subsoil specimen beneath that line.

The depth down to which the last should be taken will depend on circumstances. It is always desirable to know what constitutes the foundation of a soil, down to the depth of three feet at least, since the question of drainage, resistance to drouth, etc., will depend essentially upon the nature of the substratum. But in ordinary cases, ten or twelve inches of subsoil will be sufficient for the purposes of examination in the laboratory. The specimen should be taken in other respects precisely like that of the surface soil; while that of the material underlying this "subsoil" may be taken with less exactness, perhaps at some ditch or other easily accessible point, and should not be broken up like the other specimens.

Seventh—All peculiarities of the soil and subsoil, their behavior in wet and dry seasons, their location, position—every circumstance, in fact, that can throw any light on their agricultural qualities or peculiarities, should be carefully noted and the notes sent with the specimens. Unless accompanied by such notes, specimens cannot ordinarily be considered as justifying the amount of labor involved in their examination.

Send by express to "University of California, Berkeley, Cal., care of Prof. E. W. Hilgard."

Communications, inquiries, specimens, etc., relating to agriculture or cognate subjects, addressed to Professor Hilgard, will receive prompt attention and answer, so far as is practicable without the data to be supplied by the agricultural survey.

The methods of mechanical and chemical analysis employed have been adequately described in the previous report, for the benefit of experts. But one change has been made, in the addition of the *determination of the humus and available plant food*, according to the method of Professor L. Grandeau, of Nancy (France), which apparently solves the problem of determining how much of the mineral ingredients of the soil is, at the moment, in a condition of availability to plants in general; their absorption being, according to Grandeau's investigations, accomplished through the agency of the humus present in all profitably cultivatable soils. The method consists, substantially, in the extraction of the soil with very weak hydrochloric acid, followed, after thorough washing, by a second extraction with ammonia, the latter dissolving not only the humus, but also a certain amount of mineral substances associated therewith, whose quantity seems to be in a direct ratio to the present productiveness of the soil. So far as our investigations have gone, the latter conclusion of Professor Grandeau seems to be fully corroborated; but its final demonstration can be accomplished only by the detailed analysis of the mineral ash left after the ignition of the ammonia extract. This requires the treatment of large quantities of soil, and considerable time, which cannot be commanded with our present force. The question is, however, of such great importance, and so much more readily settled in this country than can be done with the long-cultivated soils of Europe, that I intend to take it earnestly in hand so soon as an adequate increase of working force shall make it practicable. If the method can really accomplish all

that it appears to promise, it will become possible to render soil analysis as positively indicative of the present value of a soil as the assay of an ore determines its price in the market.

RECORD OF ANALYSES.

No. 51—*Red surface soil, from the foot-hills of the Sierra Nevada, near Auburn, Placer County; taken twelve inches deep. Sent by Mr. N. S. Prosser, of Auburn. Original vegetation, oak (Q. Douglasii), pine, and chapparal.*

This is a fair sample of the red soil of the placer mines, which seems to contain a small amount of gold everywhere, and has been washed on the small scale ever since the first discovery of gold in California. It is of a dark orange color, rather light in tillage and pulverulent when dry, forming a very fine reddish dust, of considerable repute. It contains throughout, numerous fragments of slate, more or less decomposed, of all sizes, and is usually underlaid by the same, or its debris, at a variable depth, rarely less than several feet, unless lying on steep slopes.

MECHANICAL ANALYSIS.

Slate fragments and sand above .6 mm.-----	13.942 per cent.
Fine earth -----	86.058 per cent.

MECHANICAL ANALYSIS OF FINE EARTH.

Clay-----	13.911 per cent.
Sediment of <0.25 mm.-----	28.963 per cent.
Sediment of 0.25 mm.-----	2.941 per cent.
Sediment of 0.5 mm.-----	5.570 per cent.
Sediment of 1.0 mm.-----	11.392 per cent.
Sediment of 2.0 mm.-----	15.953 per cent.
Sediment of 4.0 mm.-----	10.454 per cent.
Sediment of 8.0 mm.-----	3.516 per cent.
Sediment of 16.0 mm.-----	1.121 per cent.
Sediment of 32.0 mm.-----	.265 per cent.
Sediment of 64.0 mm.-----	.161 per cent.
Total -----	94.247

A close scrutiny with the microscope failed to detect the presence of gold in any of the sediments.

CHEMICAL ANALYSIS.

Insoluble residue-----	69.52 per cent.
Potash-----	.38 per cent.
Soda-----	.07 per cent.
Lime-----	.96 per cent.
Magnesia-----	1.09 per cent.
Br. Ox. Manganese-----	.39 per cent.
Ferric oxide-----	12.42 per cent.
Alumina-----	10.97 per cent.
Phosphoric acid-----	.16 per cent.
Sulphuric acid-----	.01 per cent.
Organic matter and water-----	5.14 per cent.
	101.11
Humus-----	1.14
Available inorganic-----	1.12

It appears from the mechanical analysis that nearly half of the "fine earth," and considerably over half of the soil taken as a whole, consists of coarse materials, which may be considered as inert, so far

as plant food is concerned. Upon this basis, this foot-hill soil takes a high stand in respect to its native richness and thriftiness, being easily penetrable by the roots, well drained almost throughout, eminently retentive of moisture by virtue of its large percentage of iron (ferric hydrate), which also renders it warm and easily tillable, it possesses all the mechanical qualities to be desired. Chemically, its large percentage of lime renders it thrifty, while potash and phosphoric acid are present in quantities as large as in many black adobe soils. Notwithstanding its red tint, it also contains a respectable amount of vegetable matter, and a very liberal amount of available mineral plant food.

It thus appears that the "red foot-hill soil" is one of considerable present fertility, as well as durable for the future, and certain to respond kindly to all improvements. Its special adaptation to fruit culture has already been abundantly proven, but in its nature it seems very general in its adaptation to most crops suitable to the climate.

No. 130—*Surface soil of the second bench of the San Gabriel Valley, Los Angeles County*; taken from Alhambra Ranch, near San Gabriel, December 1877, by Mr. J. De Barth Shorb.

"A fair sample of the heavier class of soils in the San Gabriel Valley." Color, dun or brownish-gray; showing at once a good deal of small gravel and coarse sand. This soil lies higher than that on which the older orange orchards of the valley are planted, but the tree seems to thrive equally well on it when given sufficient moisture.

MECHANICAL ANALYSIS.

Weight of stones, over 1.2 mm.	7.72 per cent.
Weight of stones, between 1.2 and 1 mm.	4.73 per cent.
Weight of stones, between 1 and .6 mm.	5.07 per cent.
Fine earth	82.47 per cent.

MECHANICAL ANALYSIS OF FINE EARTH.

Clay	10.70 per cent.
Sediment of <0.25 mm.	16.32 per cent.
Sediment of 0.25 mm.	1.33 per cent.
Sediment of 0.5 mm.	6.59 per cent.
Sediment of 1.0 mm.	5.02 per cent.
Sediment of 2.0 mm.	7.09 per cent.
Sediment of 4.0 mm.	13.10 per cent.
Sediment of 8.0 mm.	8.39 per cent.
Sediment of 16.0 mm.	10.05 per cent.
Sediment of 32.0 mm.	11.39 per cent.
Sediment of 64.0 mm.	7.55 per cent.

CHEMICAL ANALYSIS.

Insoluble residue	81.12 per cent.
Potash .....	.27 per cent.
Soda .....	.17 per cent.
Lime .....	.68 per cent.
Magnesia	1.77 per cent.
Br. Ox. Manganese .....	.10 per cent.
Ferric oxide	6.30 per cent.
Alumina	6.79 per cent.
Phosphoric acid .....	.16 per cent.
Sulphuric acid .....	.07 per cent.
Organic matter and water	3.07 per cent.

100.50

Humus	
Available Inorganic	

The mechanical composition of this soil shows it to be easily tilled, with yet a sufficient amount of clay and fine sediment to render it retentive and susceptible of all improvements. In its chemical composition it must be classed as a calcareous soil when it is considered that nearly two-thirds of its mass is inert silex, while the remaining third carries nearly all the plant food. In view of the latter fact the proportion of phosphoric acid is remarkably large, being comparatively more abundant than potash, although the percentage of the latter is above the average for a soil of this character. The large percentage of iron, also, tends to render the soil warm and retentive of moisture.

No. 47—*Surface soil of mesa land*, such as forms the larger part of the arable land in the southern part of San Diego County. Taken by Mr. F. A. Kimball, of National Ranch, San Diego County, who thus describes it:

The change of tint from surface soil to subsoil occurs at depths varying from eleven to twenty-five inches, and the sample sent represents the average from widely separated places, but with the same kind of soil.

The underlying subsoil varies in thickness from two to ten feet or more, and is very retentive, of a clayey nature.

The orange, lemon, and olive seem better adapted to this "red mesa" soil than to the best valley soils of the San Diego, Sweetwater, Otay, or Tia Juana Rivers; a larger growth and earlier fruiting being invariable on the mesa. All the northern fruits, except perhaps the cherry and plum, are produced on it in the greatest perfection—the flavor of the apple and peach exceeding any I have tasted in Northern California or in the East.

The soil is of a light reddish-brown tint, rather coherent and apparently somewhat heavier in working than the soil No. 130, which it otherwise greatly resembles; containing, likewise, a considerable amount of visible gravel.

MECHANICAL ANALYSIS.

Weight of stones above 1.2 mm.	9.76 per cent.
Weight of stones between 1.2 and 1 mm.	9.11 per cent.
Weight of stones between 0.1 and 0.6 mm.	10.33 per cent.
Fine earth	70.80 per cent.
	<hr/> 99.99

MECHANICAL ANALYSIS OF FINE EARTH.

Clay	9.66 per cent.
Sediment of <0.25 mm.	10.37 per cent.
Sediment of 0.25 mm. ....	.97 per cent.
Sediment of 0.5 mm.	3.24 per cent.
Sediment of 1.0 mm.	3.82 per cent.
Sediment of 2.0 mm.	5.90 per cent.
Sediment of 4.0 mm.	8.36 per cent.
Sediment of 8.0 mm.	12.86 per cent.
Sediment of 16.0 mm.	13.54 per cent.
Sediment of 32.0 mm.	17.73 per cent.
Sediment of 64.0 mm.	12.57 per cent.
	<hr/> 99.02

NOTE—This high summation is probably to some extent due to the turbidity of the water used for analysis, which added to the weights of the finest sediments.

CHEMICAL ANALYSIS.

Insoluble residue	86.21 per cent.
Potash .....	.48 per cent.
Soda .....	.14 per cent.
Lime .....	.36 per cent.
Magnesia .....	.54 per cent.
Br. Ox. Manganese .....	.10 per cent.
Ferric oxide	3.69 per cent.
Alumina	5.12 per cent.
Phosphoric acid .....	.23 per cent.
Sulphuric acid .....	.03 per cent.
Organic matter and water	2.60 per cent.
<hr/>	
Humus .....	.555
Available Inorganic	1.439

99.50

The prominent feature of this soil is its high percentages of potash and phosphoric acid, especially of the latter, and for a soil so largely composed of coarse ingredients. When compared with the soil of the San Gabriel Valley (which it resembles in many respects), its smaller percentages of ferric oxide and of lime, together with the greater predominance of the coarse sediments over the finer ones, accounts for a somewhat greater heaviness in tillage. In humus it is somewhat deficient, and green-manuring, by the plowing-in of grasses or weeds, would doubtless add to the thriftiness of this excellent soil, which will prove both durable, and susceptible of every improvement.

No. 10—*Sediment soil deposited by the Sacramento River*; sent by Mr. Daniel Flint, January, 1878, and taken from his farm a few miles below Sacramento.

During high water and immediately after a hard storm, there are four or five different kinds of material, such as sand, sediment, etc., that come with the water, and make deposits along the banks of the river, or in the sloughs and tule lands. The fine sediment is considered the most valuable, and is supposed to come from the hydraulic mines, well up in the mountains. It certainly must contain very valuable properties, for its presence on clay land, or, in fact, on almost any land, has wonderful effect on the crops that are grown thereon.

It is a light, buff-colored silt soil; no gravel or large sand grains, as far as can be seen; almost impalpable when rubbed between the fingers.

MECHANICAL ANALYSIS.

Clay	12.062 per cent.
Sediment of <0.25 mm.	36.682 per cent.
Sediment of 0.25 mm.	6.927 per cent.
Sediment of 0.5 mm.	13.111 per cent.
Sediment of 1.0 mm.	13.665 per cent.
Sediment of 2.0 mm.	10.267 per cent.
Sediment of 4.0 mm.	3.163 per cent.
Sediment of 8.0 mm. ....	.322 per cent.

96.199

CHEMICAL ANALYSIS.

Insoluble residue	69.22 per cent.
Potash .....	.35 per cent.
Soda .....	.06 per cent.
Lime .....	.90 per cent.
Magnesia	1.25 per cent.
Br. Ox. Manganese .....	.11 per cent.
Ferric oxide	6.31 per cent.
Alumina	15.25 per cent.
Phosphoric acid .....	.25 per cent.
Sulphuric acid .....	.09 per cent.
Organic matter and water	6.75 per cent.
	<hr/>
Humus	100.54
Available inorganic	Not determined.

The composition of this sediment is remarkable in several respects. As regards its mechanical composition, it is evident in fingering it that it does not contain even as much real clay as twelve per cent., for it is almost too light for adequate retentiveness. Yet in the chemical analysis we find fifteen per cent. of alumina, corresponding to more than double that amount of clay, if it were present as such. It thus appears that the clayey material is largely in a granular condition (kaolin), so as to enter mainly into the finest sediments; but it must be highly decomposed to be soluble to such a large extent, which is seldom equalled, even in the most clayey soils.

This, doubtless, accounts for the remarkable energetic effects exerted by this sediment upon the field on which it is deposited, or, sometimes, spread purposely by farmers. Its fertility is, probably, mainly due to the large percentage of phosphoric acid contained in it, for the quarter of one per cent. is rarely exceeded even in the most fertile soils of the Mississippi bottom. The percentages of potash and lime, also, are large for a soil of its kind. If the hydraulic mines furnished no worse materials to the farmer, the latter would have little complaint to make. That, unfortunately, this is far from being the case is shown by the following analysis of a "slum soil," deposited in the neighborhood of Chinese Camp, from the waters of Cortes Creek:

No. 67—*Mining slum soil*, sent by Mr. J. Taylor, of Mount Pleasant, near Chinese Camp, Tuolumne County, December 16th, 1877.

The soil is a fine cinnamon-colored sediment, deposited from the washings of the hydraulic gold mines of Chinese Camp and Montezuma. Some of the lumps in the soil were very hard to pulverize, yet most of them yielded to pressure between the fingers.

MECHANICAL ANALYSIS.

Sand above .6 mm	1.85 per cent.
Fine earth	98.15 per cent.

MECHANICAL ANALYSIS OF FINE EARTH.

Clay	18.474 per cent.
Sediment of <0.25 mm.	27.270 per cent.
Sediment of 0.25 mm. ....	.906 per cent.
Sediment of 0.5 mm.	8.196 per cent.
Sediment of 1.0 mm.	10.563 per cent.
Sediment of 2.0 mm.	11.975 per cent.
Sediment of 4.0 mm.	9.228 per cent.
Sediment of 8.0 mm.	6.608 per cent.
Sediment of 16.0 mm.	1.240 per cent.
Sediment of 32.0 mm. ....	.873 per cent.
Sediment of 64.0 mm. ....	.824 per cent.

96.157

CHEMICAL ANALYSIS.

Insoluble residue	72.98 per cent.
Potash .....	.19 per cent.
Soda .....	.21 per cent.
Lime	1.19 per cent.
Magnesia	2.32 per cent.
Br. Ox. Manganese .....	.08 per cent.
Ferrie oxide	9.30 per cent.
Alumina	10.55 per cent.
Phosphoric acid .....	.08 per cent.
Sulphuric acid .....	.03 per cent.
Organic matter and water	4.43 per cent.
	<hr/>
Humus	101.36
Available inorganic .....	.42
	.36

This is rather an unpromising material for a soil. It is quite poor in the two most important ingredients of plant food, potash and phosphoric acid, and it will probably be somewhat refractory in tillage for some time. In humus and available plant food, it is naturally poor as yet, but its redeeming feature, the large percentage of lime, will enable it to overcome this objection after having been covered with vegetable growth for some time.

A comparison of this sediment with the one previously discussed seems to show that there must be a very great difference in the agricultural value of these sediments coming from different valleys, for if the general sediment of the Sacramento River is so rich, despite the incoming of such poor materials as the one last described, the slum coming from some of the valleys must be of extraordinary richness and a benefit to any lands covered by it, when unaccompanied by the floods of gravel that render the richest materials practically useless for the purposes of the husbandman.

The sediment, No. 67, now covers the original soil, No. 68, to a depth at which the latter is practically out of reach of the roots of crops. An analysis of the soil underlying at the point where No. 67 was taken, at a depth of two feet, is given below.

No. 68—*Valley adobe soil*, sent by Mr. J. Taylor, of Mount Pleasant, December, 1877.

It is a black, clayey soil, underlying the "mining slum" soil, No. 67, and was quite fertile.

MECHANICAL ANALYSIS.

Weight of stones over 1.2 mm.	25.33 per cent.
Weight of stones between 1.2 and 1 mm.	5.804 per cent.
Weight of stones between 1 and .6 mm.	4.749 per cent.
Fine earth	64.116 per cent.

MECHANICAL ANALYSIS OF FINE EARTH.

Clay	26.100 per cent.
Sediment of <0.25 mm.	35.580 per cent.
Sediment of 0.25 mm. ....	.835 per cent.
Sediment of 0.5 mm.	3.987 per cent.
Sediment of 1.0 mm.	4.791 per cent.
Sediment of 2.0 mm.	5.974 per cent.
Sediment of 4.0 mm.	4.450 per cent.
Sediment of 8.0 mm.	5.440 per cent.
Sediment of 16.0 mm.	4.229 per cent.
Sediment of 32.0 mm.	2.877 per cent.
Sediment of 64.0 mm.	3.202 per cent.

97.465

CHEMICAL ANALYSIS.

Insoluble residue	56.61 per cent.
Potash .....	.19 per cent.
Soda .....	.14 per cent.
Lime .....	.68 per cent.
Magnesia	13.74 per cent.
Br. Ox. Manganese .....	.08 per cent.
Ferric oxide	} 18.43 per cent.
Alumina	
Phosphoric acid .....	.07 per cent.
Sulphuric acid .....	.01 per cent.
Organic matter and water	9.84 per cent.
	99.79
Humus	1.614
Available Inorganic .....	.395

This is a very remarkable soil, in more than one point of view. On the whole it is not dissimilar to the "slum" soil that has overrun it, and as regards the essential ingredients of plant food it is no richer than the latter, except as regards the humus, and, consequently, the nitrogen and proportion of available plant food. For the time being it would produce better than the slum soil, but ultimately both would be about equally durable, while neither takes a high rank in that respect. The unique feature of the adobe, in this case, is the extraordinary amount of magnesia, in which it exceeds all cultivatable soils that have come under my notice heretofore. Both soils are doubtless derived substantially from the same original source, but the magnesian rock-powder has, in the case of the adobe, been so far decomposed by atmospheric action as to render its base soluble in the acid used in the analysis, while in the slum soil most of the magnesia has doubtless remained in the insoluble part.

No. 77—"Dry bog soil," from *Tulare Lake*; sent by Mr. E. R. Thomson, August 12th, 1878.

The specimen was taken from the reclaimed "swamp and overflowed" land, on the east side of *Tulare Lake*; is inclosed by a levee, and lies below the high-water mark of the lake; eighteen months before it was all under water, but at the time of taking the sample the water was half a mile from the levee. The first vegetation that started after it was laid dry was "wild parsley," followed later by wire grass, salt grass, and tule. The surface at the present time shows no salt and but little indication of alkali. Grain, however, "burns up" when hot weather comes, even though the ground be moist. Garden vegetables look well until blooming time, and then die.

When sampling the soil at the time stated, it was found to be baked quite hard for the first six inches; from that line down to twenty inches, to which depth it was taken, it was "boggy and soft." The soil as received is a somewhat bluish-gray clayey sediment, containing a good deal of small gravel and shells intermixed. Its reaction is alkaline, though not sharply so.

MECHANICAL ANALYSIS.

Gravel and shells above 0.6 mm. in diameter	4.1 per cent.
Fine earth	95.9 per cent.

MECHANICAL ANALYSIS OF FINE EARTH.

Clay	29.793 per cent.
Sediment of <0.25 mm.	13.840 per cent.
Sediment of 0.25 mm.	1.567 per cent.
Sediment of 0.5 mm.	2.195 per cent.
Sediment of 1.0 mm.	8.183 per cent.
Sediment of 2.0 mm.	8.622 per cent.
Sediment of 4.0 mm.	9.722 per cent.
Sediment of 8.0 mm.	6.641 per cent.
Sediment of 16.0 mm.	2.115 per cent.
Sediment of 32.0 mm.	2.407 per cent.
Sediment of 64.0 mm.	1.275 per cent.

86.360*

According to this analysis this is a clay soil, which, however, should till well, in consequence of the uniform distribution of the sediments. It seems, however, to acquire tilth with some difficulty at present.

CHEMICAL ANALYSIS.

Insoluble residue	67.34 per cent.
Potash	1.05 per cent.
Soda .....	.84 per cent.
Lime	6.51 per cent.
Magnesia	3.96 per cent.
Br. Ox. Manganese .....	.04 per cent.
Ferric oxide	5.05 per cent.
Alumina	7.97 per cent.
Phosphoric acid .....	.32 per cent.
Sulphuric acid .....	.08 per cent.
Organic matter and water	3.71 per cent.
Carbonic acid	4.42 per cent.

101.29

Humus .....	.468
Available inorganic	2.184

This shows the general composition of the soil to be excellent, so far as the important ingredients of plant food are concerned. The amounts of potash and phosphoric acid are equal to those in the most productive soils of the Mississippi bottom, and the large percentage of lime should insure its thriftiness and kindly tillage. But it is evident from its alkaline reaction, and the large percentage of soda shown, that it contains enough of the true "alkali" to interfere seriously with tillage as well as with the welfare of vegetation. At the same time the solution formed by hydrochloric acid showed the want of aeration in giving an indication of iron protoxide. These inferences are, moreover, corroborated by the observation made by Mr. Thomason, that wheat made some fine ears on the upper portion of a part of the levee where, of course, the rain had washed out the soda and the air had had ample access. On the basis of these facts the following advice as to the treatment of the land was given to Mr. Thomason:

First of all give the soil a dressing of at least 600 pounds of plaster per acre. You will then find that it will till better, and that weeds will grow on it different from those it now bears.

The soil evidently has not had sufficient time and tillage to get thoroughly aired after its reclamation from the waters of the lake. It evidently needs greatly a summer's fallow, and that to the greatest depth that a big plow and a strong four-horse team can go.

If I understand correctly that it was "boggy" at a depth a little below six inches, it is too full of water yet to allow of the healthy life of crop roots. This implies drainage of some kind protected against the backwater of the lake.

* NOTE.—The low summation of this analysis is due to the dissolution of lime, and some alkaline salts, in the large quantity of water employed, the clay at first falling altogether to diffuse until these salts had been washed out. The loss bears mainly, of course, upon the fine sediments.

According to information lately received from Mr. Thomason, crops have been a total failure in this region in 1879, but half an inch of rain having fallen for the entire season. He has now laid off the reclaimed land in checks, and proposes to irrigate it by means of a ditch from the lake, raising the water by a powerful centrifugal pump. The question has been raised whether the lake water is not itself too alkaline to admit of its being used for irrigation, especially on land already somewhat impregnated with the same. This question, which is of wide importance in connection with the irrigation of the San Joaquin Valley, I propose to investigate in the near future. If Mr. Thomason's experiment should show the practicability of reclaiming the wide belt of land similar to his tract that lies around the lake, it would be a matter of great importance to that section of the State.

In order to gain some insight into the mechanical nature of the "tailings" so extensively produced by quartz mills, and the possible representation of what is usually designated as "clay" in the above mechanical analyses, by fine mineral powder of a different chemical nature, a mechanical analysis of the fine tailings of a quartz mill of the Consolidated Virginia mine was made at the suggestion of Dr. G. F. Becker, late of the University of California. The result was as follows:

Sediment of	.0023 mm. hydr. value ("clay")	41.271 per cent.
Sediment of	<0.25 mm.	56.962 per cent.
Sediment of	0.25 mm.	1.425 per cent.
Sediment of	0.5 mm.	.323 per cent.
Sediment of	1.0 mm.	0.19 per cent.
		100.000

When it is considered that the above 41.27 per cent. represent powder of such fineness that *it fails to settle through a space of 200 mm. (about eight inches) in the course of 24 hours*, this result is rather surprising; and although the natural operations by which soils are formed can rarely be supposed to carry the pulverization of hard minerals to such a degree of fineness, we are yet obliged to conclude that while applying the name of "clay" to all that part of the soil embraced within the above limit, we may often be dealing with a material very essentially different in its mechanical effect on tillability from true clay. It also suggests that the concentration of the plant food in this finest part of the soil, as demonstrated by Loughridge and myself (*American Journal of Science*, January, 1874) need not be attributed to any specific peculiarity of clay, as such, but rather, probably, to its association, by virtue of its fineness, with equally fine pulverulent compounds, formed largely of the mineral ingredients of plant food.

It will also be observed that the tailings examined contain less than two per cent. of quartz powder which will settle through an eight-inch column of water in less than ten minutes (0.25 mm. hydr. value, and over).

II. ALKALI SOILS.

[NOTE.—The general remarks on alkali soils are substantially reprinted from the last biennial report, for obvious reasons.]

This name is applied in California, almost indiscriminately, to all soils containing an unusual amount of soluble mineral salts, whose presence is frequently made apparent by the "efflorescence," or blooming-out on the surface, of a white powder or crust, soluble in water. This "alkali" becomes most apparent in dry weather following upon rains or irrigation. Later in the season it usually becomes less perceptible from intermixture with dust, as well as from the failure of the soil-water to rise near enough to the surface. The first rain, dissolving the salty substances, carries them partly into the water-courses, but chiefly back into the soil, whence they rise again at the recurrence of dry weather.

The immediate source of the "alkali" is usually to be found in the soil-water, which, rising from below and evaporating at the surface, deposits there whatever of dissolved matters it may contain. Such water, when reached by digging, is by no means always perceptibly salty or alkaline; and the same is true of the soil an inch or two beneath the surface. For since the soil, acting like a wick, draws up the soil-water and allows it to evaporate at the surface, it is *there*, of course, that all the dissolved matters accumulate, until the solution becomes so strong as to injure or kill all useful vegetation. The injury will usually be found to be most severe just at or near the crown of the root, where the stem emerges from the soil.

The most obvious remedy for this evil is, of course, the leaching-out of the injurious salts by flooding, and, if possible, *under-draining*. This method is habitually resorted to in sea-coast marshes, near the mouths of rivers, after the salt water has been excluded by embankments.

The limited salty spots so frequently met with in the uplands of some regions are promptly cured by a few under-drains, through which the winter rains wash the salts definitely beyond the reach of the soil-water. Such spots are very commonly found extraordinarily fertile afterwards.

The problem of affording relief, however, becomes much more difficult when either a stratum of saline water, or an earth-layer, containing much saline matter, lies a few feet beneath the surface in a level region—as is, unfortunately, very often the case in California. When this happens the evil can only be mitigated, but scarcely altogether cured. According to the value of the land to be reclaimed, one or several of the following remedies may then be employed:

1. When the "alkali" is not very abundant or noxious, *frequent and deep tillage*, may afford all the relief needed. For, inasmuch as the damage is in most cases the result of an excessive accumulation *at or near the surface*, it is clear that frequent intermixture of the surface layers with the deeper portions of the soil will so dilute the injurious salts as to render them powerless for harm.

With the aid of deep tillage, it is often possible to raise on salty sea-shore lands, root crops, such as beets or carrots, which absorb a large amount of soluble salts, and sensibly relieve the soil; so that cereal crops may be grown the second or third year.

2. *Under-drains* may so far lower the water-table from which the saline matters are derived, and may so far favor the washing out of

the salts during the rainy season, that the latter will thereafter fail to reach the surface so as to accumulate to an injurious extent, with reasonably deep tillage. The roots of plants will go deeper for the requisite moisture, but will not be injured by the weak saline water below.

3. When the quantity of the salt or alkali is small, but its nature such as to be nevertheless very injurious or corrosive, the evil may be greatly mitigated, or sometimes completely relieved, by the application to the soil of *chemical antidotes*, cheaply procurable in commerce. In order that the proper antidote may be chosen, it is of course necessary to determine the nature, and in a measure the amount, of the "alkali," by chemical analysis.

The salts usually found in the California "alkali" soils, so far as they have come under my observation, are of three kinds:

a. Neutral alkaline salts, such as common salt, Glauber's salt, sulphate of potassium, etc. These are injurious only when present in large quantities, and relief can then be obtained only by washing them out of the soil—by flooding, under-draining, etc.

b. Soluble earthy and metallic sulphates and chlorides, such as Epsom salt, bittern, chloride of calcium, alum, copperas, etc. The cheap and efficient antidote to these substances is LIME; in some cases, even a natural calcareous marl will answer the purpose.

c. Alkaline carbonates and borates. These, especially the former, are injurious in the smallest amounts, rendering the soil-water caustic and corrosive. They appear to be most abundant in southern California, while the second and first class seem to prevail in the Sacramento Valley. The antidote to these, the *true* alkali salts, is *gypsum* or land plaster.

The efficacy of these antidotes depends, of course, upon *the presence of water, without which they cannot act on the "alkali."* They should be sown or spread on the surface, and plowed or harrowed in to a moderate depth, just prior to irrigation, where that is used; in the case of plaster, put in with the grain; in that of lime, it should be put in just before a rain, or irrigation, and *not* at the same time with the grain or other seed.

A welcome opportunity for observing, personally, some of the alkali soils of the San Joaquin Valley was afforded me through the invitation of Stockton Grange to deliver a lecture on the subject in their hall, on January 5th, 1878. On the following day a tract of alkali land on the farm of Mr. C. L. Overhiser, four miles northeast of Stockton, was carefully examined in company with Mr. Overhiser and Dr. Grattan, and the several soils sampled for analysis.

The tract in question forms part of a larger belt, said to extend from near (north of) Stockton to the foot-hills, about fourteen miles, with an average width of about one mile. This area is readily recognized by its pitted or "pock-marked" appearance, the low portions being impregnated with alkali and more or less incrustated with it on the surface during the dry season; while after rains pools of dark-tinted water remain standing on them for weeks after the higher portions are dry and in tillable condition. These higher portions, forming hillocks and ridges, elevated, on an average, ten to eighteen inches above the alkali spots, and also bordering the whole tract, consist of a fine mellow loam soil, such as would be chosen for a garden, and very productive wherever the alkali does not influence it. Unfortunately, it lies so intimately interspersed with the alkali

spots that it is practically impossible to cultivate one without the other. A short time before my visit Mr. Overhiser had made a desperate attempt to conquer the refractory alkali soil. A mixed tract of the two soils had been plowed, cross-plowed, rolled, and harrowed, until the harrow produced no further effect; and the result was a seed-bed of soil clods ranging from the size of a pea to that of a billiard ball, but no tilth. At the same time the portions of the "ridge" soil so treated were reduced to an ashy condition of tilth. Some of the alkali land had also been heavily manured, and a fair stand of grain was springing up, but Mr. Overhiser stated that, in accordance with previous experience, he expected to see the stalks "spindle up" and turn yellow about the time of going to ear, unless the weather continued unusually moist, so as to prevent the rise of the alkali to the root crowns.

Inspection seemed to show that the two soils differ but little in mechanical composition; not nearly enough to account for such difference of tilling qualities, for when worked into a paste with water it was difficult to say which of the two was the heavier soil, and on drying from this condition both formed lumps about equally hard. For the final determination of this question, the two kinds of soil were subjected to comparative mechanical analysis, with the results recorded below.

The non-alkaline soil (No. 8 of University collection) was taken to the depth of twelve inches from the surface; its subsoil (No. 12) from twelve to eighteen inches. Its natural growth is large white oaks (*Q. lobata*), with sweet grasses covering the ground.

The alkaline soil (No. 9) was taken to the depth of ten inches, at which its color changes into that of the subsoil (No. 11), which was taken down to fifteen inches depth. Alkali grass (*Brizopyrum*) is almost its only growth.

Both subsoils (Nos. 11 and 12) are very much alike in appearance, being of a gray tint, very compact, and disposed to be cloddy. Both show an alkaline reaction on litmus paper (blueing the red paper); the subsoil of the alkaline spots being, however, decidedly the stronger.

The mechanical analysis of the two surface soils resulted as follows:

MECHANICAL ANALYSIS OF SOILS FROM C. L. OVERHISER'S FARM.

	No. 8.	No. 9.
Stones larger than 1.2 mm.-----	.402 per cent.	.55 per cent.
Stones between 1.2 and 0.6 mm.-----	1.61 per cent.	2.14 per cent.
Fine earth-----	97.99 per cent.	97.31 per cent.
	No. 8, Non-alkaline.	No. 9, Alkaline.
Clay-----	20.8 per cent.	24.6 per cent.
Sediment <0.25 mm. hydraulic value-----	32.0 per cent.	26.1 per cent.
Sediment 0.25 mm. hydraulic value-----	3.3 per cent.	3.3 per cent.
Sediment 0.50 mm. hydraulic value-----	6.6 per cent.	9.4 per cent.
Sediment 1.0 mm. hydraulic value-----	5.6 per cent.	6.2 per cent.
Sediment 2.0 mm. hydraulic value-----	7.3 per cent.	6.2 per cent.
Sediment 4.0 mm. hydraulic value-----	7.5 per cent.	5.4 per cent.
Sediment 8.0 mm. hydraulic value-----	5.7 per cent.	4.8 per cent.
Sediment 16.0 mm. hydraulic value-----	4.8 per cent.	4.7 per cent.
Sediment 32.0 mm. hydraulic value-----	1.5 per cent.	5.9 per cent.
Sediment 64.0 mm. hydraulic value-----	1.2 per cent.	1.1 per cent.
	96.4	97.7

The only material difference in the mechanical composition of these two soils is in the relative amounts of clay and finest sediment; and this is perhaps more apparent than real, inasmuch as the disintegrating action of the alkali has doubtless been instrumental in bringing out as "clay" in the alkaline soil, a portion of what in the other has remained behind in the finest sediment. Still, as the alkali soil lies close to and lower than the tillable soil, and receives its washings, it should contain somewhat more clay than the latter. Taking the results as they are, however, it is clear that the mechanical composition of the alkali soil gives no clue to the cause of its behavior under tillage, since a soil containing no more than 24.6 per cent. of clay, with all sediments above the finest so evenly distributed, should be classed simply as a "clayey loam." Moreover, the difference in the tilling qualities of the two soils should, so far as their mechanical composition goes, be only very slight. The chemical examination gave the following results:

The non-alkaline surface soil (No. 8) shows with blue litmus paper a faintly acid reaction (as is usually the case in cultivated soils). The alkaline surface soil shows a sharply alkaline reaction on litmus paper, and portions of it exhibit on the surface white needle-shaped crystals, apparently of carbonate of sodium. In the dead-furrows on the alkali tract stood puddles of dark-colored water, an analysis of whose solid contents is given below; alongside of that obtained by leaching the alkali soil in the laboratory, evaporating the coffee-colored lye, and burning off the vegetable matter. The total amount of residue obtained by the latter process amounted to a quarter of one per cent. (0.251) of the dry soil. Of this amount, 0.158 was again soluble, 0.093 remaining behind as earthy salts, etc. The soluble part was constituted thus:

	Soil extract.	Dead-furrow puddles.
Carbonate of sodium-----	52.74 per cent.	64.01 per cent.
Chloride of sodium-----	38.08 per cent.	13.06 per cent.
Sulphate of sodium-----	13.26 per cent.	} 22.93 per cent.
Tri-sodic phosphate-----	1.83 per cent.	
	100.91	100.00

The insoluble part of the aqueous extract gave:

Carbonate of calcium-----	14.02 per cent.
Tri-calcic phosphate-----	5.37 per cent.
Tri-magnesian phosphate-----	5.77 per cent.
Silica (soluble in Na_2CO_3)-----	24.37 per cent.
Iron oxide, alumina, and some clay (by difference)-----	50.47 per cent.
	100.00

It will be observed that notwithstanding the presence of considerable amounts of neutral sodium and calcium salts (which tend to render the soil more tillable), that of about 0.08 per cent. of carbonate of sodium was sufficient to render the soil practically untillable.

In view of these facts, there can be no doubt that in this case, as in many others heretofore reported, a very moderate dressing of gypsum on the alkali spots would serve to reclaim the soil, by transforming the small amount of carbonate of soda into inert Glauber's salt. When the experiment is tried on the small scale, the effect is instantaneous; on the large scale, in the field, it would probably require several seasons tillage to overcome entirely the long established cloddiness. But there would be no more injury to crops from "burning up" by the caustic effect of the alkali. Mr. Overhiser has not, as yet, experimented on the subject, but reports from others cultivating lands on the same alkali belt fully sustain the expectation that was entertained by me.

The above analyses show one point of great importance, not previously noticed, namely, that these alkali salts contain, among their ingredients, notable amounts of phosphates soluble in the soil-water. The inference is that this needful ingredient of plant food is present in these soils in unusually large quantities, but that, if reclaimed by drainage alone, the phosphates would be washed out with the injurious salts, and the soil be thus materially impoverished.

As it happens, gypsum will also completely remedy this trouble; for the soluble phosphates will, under its action, be transformed into bone phosphate, which being but very slightly soluble will remain diffused in the soil in a very finely divided condition, in which it will be as available to plants as so much superphosphate. Whether or not the soil-water would continue to supply these phosphates from the lower strata, and thus render the land inexhaustible in this respect, is a question deserving farther examination.

Should this not prove to be the case it might be thought that the total amount of phosphoric acid so contained in the soil is too small to be of any consequence, since when expressed in percentage it amounts to only 0.0064 per cent. When, however, we calculate the absolute amount present in an acre of the soil, taken to the depth of twelve inches (which would weigh about three and three-fourths millions of pounds), we find that it amounts to about 240 pounds, or

the quantity which being absolutely available to crops would, *e. g.*, suffice for sixteen crops of wheat, of 25 bushels to the acre; or, expressed differently, it is equivalent to a ton of good commercial superphosphate for which at least \$45 would have to be paid. At least an equal amount must, moreover, be estimated to be present in the soil in the ordinary condition—mechanically absorbed and insoluble in water, yet available to plants. Hence the above estimate of wheat crops for which the soil contains an immediately available supply must be at least doubled, and after that is exhausted there would still probably remain a supply as great as is ordinarily present in soils. It would thus seem probable that when reclaimed by the use of gypsum, and possibly some drainage, such soils would prove extraordinarily and lastingly productive when properly treated. Experience had elsewhere adds probability to this conclusion.

Since attention was drawn to the presence of phosphates in notable quantities in these alkali salts the same has been noted in other alkali soils of the carbonate class. Such is the case in the following one:

No. 20—*Alkali soil from Curtis' Ranch, two miles north of Stockton; sent by D. A. Learned, of Stockton.*

This specimen was the top crust, about an inch deep, of a low alkaline spot. A mouse-colored loam, rather light, showing here and there alkaline crusts; taste, decidedly alkaline; its natural vegetation is alkali grass and mallow; little else can be made to grow on it in ordinary seasons.

The soluble extract amount to 3.73 per cent., which consisted of the following salts:

Sulphate of sodium	75.846 per cent.
Chloride of sodium	16.376 per cent.
Carbonate of sodium	6.290 per cent.
Phosphate of sodium	1.086 per cent.
	<hr/> 99.598

These salts are not nearly as corrosive as those from Overhiser's tract, but their injurious effects on vegetation are still due to the same substance, namely, carbonate of sodium, or "soda," which can be rendered harmless by the use of gypsum. Here, also, there is a notable amount of soluble phosphate present.

The alkali in this spot seems to be somewhat more abundant than on Mr. Overhiser's tract, but of a much less caustic quality; there being only 6.13 per cent. of carbonate of sodium against 50 and over in the latter case. A dressing of gypsum will here, also, mitigate the effects on vegetation, but it may be necessary to drain the soil in order to remove the excess of salts.

Two samples of *alkaline soils from the bottom of Merced River*, from his farm on S. 7, T. 5, R. 15 E., were sent by Mr. Erastus Kelsey, of Merced Falls. Both are sediment soils, light, several feet to as many as ten in depth, and then underlaid by gravel; therefore apparently well drained.

No. 18—*White alkaline crust from surface of Merced bottom.*

A qualitative analysis showed this sample to contain almost pure carbonate of sodium, with very small amounts of sulphate and chloride.

No. 19—*Surface of alkali soil near Mr. Kelsey's residence.*

This occurs on a ridge between two ditches near the river. When

irrigated it produced well in good seasons, and was for some time planted with tobacco. The product was of good quality, but of so unusually lively a character as to crackle and burn in the pipe without any effort on the part of the smoker, and somewhat unprofitable on account of its rapid burning off. It was conjectured to contain a good deal of saltpetre.

The specimen contain about 79 per cent. of soluble matter; this, when heated, deflagrates rather violently. Dried at 100 degrees it was found to consist of—

Chloride of sodium	1.212 per cent.
Sulphate of sodium	3.878 per cent.
Di-sodic-hydric phosphate	4.099 per cent.
Nitrate of sodium	10.717 per cent.
Carbonate of sodium	63.085 per cent.
Organic matter (by difference)	17.009 per cent.
	<hr/> 100.000

According to a subsequent determination the soil to the depth of twelve inches contains, on an average, about one per cent. of the above mixture of salts.

The occurrence of so comparatively large an amount of saltpetre in a natural soil, in such a location, is difficult to explain. It is not easy to conceive of a permanent source of nitrogenous matter in an open river bottom; and in fact, the persistence of the soda salts, so near a channel of flowing water, is somewhat remarkable, considering that the soil is usually underlaid by a gravel bed at a depth varying from two to ten feet. Under the gravel there lies, at varying depths, a slightly calcareous claystone, in horizontal beds of the tertiary formation; and these, again, overlie or abut against almost vertically upturned shales (usually termed slates) of very ancient date. It may be that an ancient basin-shaped channel of the impervious tertiary rock underlies the alkaline tract, preventing its drainage toward the river, and thus keeping it permanently impregnated with one and the same quantity of soluble salts. In any case it is not likely to prove a source from which soda saltpetre for commercial purposes could be derived.

No. 220—*Alkali salts from the neighborhood of Riverside, San Bernardino County*; sent by Mr. H. J. Rudisill.

This was an incrustation taken from near the base of the mountains, on a soil composed of granite debris.

The solution was slightly yellow, had a strong salty taste, and alkaline reaction. Upon evaporating it a considerable quantity of carbonate of magnesium, with a little lime, was deposited, showing the presence of soluble magnesium salts. The salts left in solution were composed as follows:

Sulphate of sodium (Glauber's salt)	77.44 per cent.
Chloride of sodium (common salt)	22.16 per cent.
Carbonate of sodium ("soda")	0.68 per cent.
Total	<hr/> 100.28

The injurious effects of this mixture upon vegetation would be due chiefly to the soda, and to the soluble magnesian salts that might be formed in the soil by its coöperation. A very small application of gypsum would doubtless relieve any soil not too heavily charged with this salty mixture.

No. 21—*Alkali soil from near Hueneme, Ventura County*; sent by Mr. L. B. Benchly, of that place.

It is a light, sometimes sandy soil, has a slight salty taste; in places shows efflorescence of white salts. Barley seems to do well on it until about the time of heading out, when it "burns up and dies."

Water extracts from the soil 1.25 per cent. of salts, of which amount 1.017 is again soluble in water after ignition, and consists of:

Chloride of sodium (common salt)	22.10 per cent.
Sulphate of sodium (Glauber's salt)	42.50 per cent.
Sulphate of potassium	5.64 per cent.
Sulphate of calcium (gypsum)	2.50 per cent.
Sulphate of magnesium (Epsom salt)	25.61 per cent.
Chloride of magnesium (Bittern)	0.75 per cent.
	<hr/> 99.10

The insoluble part of the extract, 0.243 per cent. of the soil, consisted of:

Sulphate of calcium (gypsum)	72.64 per cent.
Carbonate of calcium	0.06 per cent.
Carbonate of magnesium	27.30 per cent.
	<hr/> 100.00

According to this composition of its salts, this soil is not properly an "alkali" soil at all. Its soluble ingredients are derived simply from the evaporation of sea water; and while their amount is rather large for most cultivated plants, yet their effect would scarcely be so decidedly fatal were it not for the Epsom salt present. The latter can be decomposed by the action of burnt lime, applied at the rate of about two barrels per acre. This would reduce the total percentage of salts to about three-quarters of one per cent., and with reasonably deep tillage, or even a breaking up of the surface late in the season with a cultivator, ought not to hurt most crops.

Crust of "alkali" soil occurring near Collinsville, Solano County; sent by Mr. H. R. Baker. A light-colored powder, largely soluble in water.

It consists mainly of Epsom salt, mixed with a little Glauber's and common salt; therefore belongs to the same class as the salts from Sherman Island, mentioned in the previous report (p. 45), and like these, can be relieved by the application of quicklime. How much of this should be used, and whether, after its use, the soil will be sufficiently relieved from the *neutral* alkaline salts (Report 1877, p. 44), can only be determined by an examination of the soil in mass or by experiment.

White alkali salts from near Benton, Mono County.

Said to occur in large quantities, and used at the Camanche Mill, near Benton, as a flux in the reduction of ores. This substance is chiefly carbonate of sodium, with some Glauber's and common salt. Land moderately impregnated with it would therefore be relieved by the use of gypsum.

"Alkali" salts from near Reno, Nevada; sent by William L. Ross, Assistant Secretary of Nevada State Agricultural Society, with request for examination, and the statement that the reclamation of the land thus impregnated would be of importance to a very large district. Also that, if it could be accomplished by the use of gypsum, that material could be procured in unlimited quantities near at hand.

The substance was found to consist almost wholly of sulphate of

sodium or Glauber's salt, with some common salt, gypsum, and magnesian salts. The result being that the gypsum would be of no avail, and that the only mode of obtaining relief would be the washing-out of the soluble salts.

Alkali from the Emigrant Ditch region, Fresno County; sent by Mr. J. W. A. Wright, of Hanford.

Consists almost wholly of sodium carbonate, with a little common salt; can therefore be neutralized by the use of gypsum.

Alkali soil from Mr. J. Simpson's place, near Lemoore, Tulare County; sent by Mr. J. W. A. Wright.

The salt impregnating this soil is chiefly sulphate of sodium or Glauber's salt, with a little Epsom salt. The soil can therefore be relieved only by drainage, especially as the salts are so abundant that the removal of the Epsom salt by quicklime would probably be inadequate.

Alkali salts from Tulare County, (locality not given); sent by Mr. J. W. A. Wright, April, 1878.

Almost precisely like the last in composition, and therefore in the same category as regards relief.

III. LIST OF CALIFORNIA SOILS

IN THE COLLECTION OF THE AGRICULTURAL DEPARTMENT OF THE UNIVERSITY, DECEMBER 1, 1879.

In April, 1877, a bulletin was issued by the University requesting of persons interested in the study of the agricultural resources of the State, the transmission of soil specimens, representative of the cultivatable soils of their respective regions, together with such information regarding their cultivation, adaptations, and peculiarities, as would be useful in giving direction to the examinations to be made in the laboratory, in order to ascertain their nature and probable best modes of cultivation and improvement. It would thus become possible not only to furnish cultivators important information regarding the nature, treatment, and ultimate value of their soils, but also, in the end, to lay down on the map of the State its various agricultural regions, for the benefit of farmers and immigrants.

A number of specimens were received as the result of this circular. In autumn of the same year, an organization, for the purpose of securing a representation of California products at the Paris Exhibition of 1878, was formed in the City of San Francisco, and it was suggested that a collection of California soils would form an interesting addition to the State exhibit, especially if accompanied by good descriptions of the general features of their regions of occurrence. I being requested to undertake the elaboration of this branch of the exhibit, a second edition of the circular relating to soil specimens was prepared and distributed, in connection with another, making suggestions in regard to the descriptions to be given of the several regions. In response to these circulars, about 120 soil specimens were received from different parts of the State—some accompanied by excellent and elaborate reports of the climatic and other local features, such as would be of interest to the settler and immigrant.

Soils, or sets of soils, accompanied by such reports are marked with an asterisk (*) in the following list.

Owing to the failure of the Legislature to make an appropriation for the purpose, this portion of the Exhibition programme was not carried out, the soil specimens and reports remaining at the University. At my suggestion and request, the expenses incurred in their transportation were subsequently assumed by the University—thus forming the nucleus of a general collection representative of the soils of the State, which has now increased to over 200 numbers. The list is published for information, with the hope that persons residing in the regions insufficiently represented, or not at all, will hereafter aid in the completion of the representation collection.

As regards the special investigation of these soil specimens, it should be understood that while all are intended to receive, in time, such examination as may be required to ascertain their character and merits, the means at present at the command of the University will not suffice to carry out the whole scope of the work within any brief space of time. It is intended to take in hand, first, such representative specimens as will soonest lead to a general classification of the soils of the several regions, without at once going into the details of each, save in cases where some important interest or industry calls for more immediate action. In pursuance of this policy, preference has generally been given, in point of time, to the investigation of questions relating to crops and products *directly*—leaving the general work of soil investigation to progress as time can be spared from the more pressing subjects, or until more ample means be placed at the command of the agricultural department for these purposes.

The reports and descriptions sent with the specimens are on file, and will be published in part, or whole, whenever the examination of the soils to which they refer shall have been made.

SAN DIEGO COUNTY.

*No. 45—Hill adobe soil, sent by F. A. Kimball, National City.

*No. 47—"Mesa top-soil," sent by F. A. Kimball, National City. This sample is a mixture taken from many places, and at varying depths, according to the point at which a change of tint occurred. (For analysis of this soil see page 23.)

*No. 46—Subsoil of the above, taken in the same spots at depths from twelve inches to two feet.

LOS ANGELES COUNTY.

No. 13—Alkali soil, sent by Mr. S. G. Baker, of Corvallis.

No. 14—Alkaline subsoil, from near Los Angeles.

No. 15—Alkali soil, sent by W. G. McPherson, Westminster.

No. 17—"Alkali" (salty) soil from near Anaheim, sent by Charles D. Ellis, Anaheim.

(For analyses of Nos. 13, 15, and 17, see report of 1877, pp. 45 to 47.)

No. 30—Alkali soil, sent by Robert Strong, of Westminster.

No. 31—"Heavier loam soil," sent by same.

No. 32—Loam soil, sent by same.

No. 33—"Light sandy soil," sent by same.

*No. 39—"Sediment land," sent by W. R. Olden, of Anaheim.†

*No. 40—"Light sandy loam," sent by same.†

*No. 41—"Medium sandy loam," sent by same.†

*No. 42—"Heavy sandy loam," sent by same.†

*No. 43—"Valley land soil," sent by same.†

*No. 44—"Mesa or table-land soil," sent by same.†

*No. 86—Surface soil, sent by J. D. Taylor, Anaheim.

*No. 87—Subsoil of above, sent by same; subsoil of No. 86, taken at a depth from change of tint to two feet.

*No. 88—Alkali and salt land, sent by same; taken to a depth of twelve inches.

*No. 89—Alkali and salt land subsoil, sent by same; depth, from change of tint to two feet.

† Depth, six to twelve inches or more.

LOS ANGELES COUNTY.

- No. 130—"Heavier soil," sent by J. De Barth Shorb; sample taken from the Alhambra Ranch, near Los Angeles. (For analysis of this soil see p. 22).
- No. 131—"Light soil," sent by J. De Barth Shorb, San Marino; sample taken from Alhambra Ranch.
- No. 132—"Gravelly soil," sent by J. De Barth Shorb, from ranch at San Marino.
- No. 133—"Black soil," sent by J. De Barth Shorb, San Gabriel, from ranch at San Marino.
- No. 134—Orange orchard soil, sent by J. De Barth Shorb, from a ranch at San Marino.
- No. 135—Sent by J. De Barth Shorb, of San Gabriel.
- No. 136—Orange orchard soil, sent by John Anderson, of Orange; soil taken from land of Messrs. Rusk & Clark, near Orange Center.
- No. 137—Surface soil, sent by John Anderson, of Orange; taken from land owned by Mr. Squires, near the foot-hills north of Orange Center.
- No. 138—Surface soil, sent by John Anderson, of Orange, from near Orange Center.
- No. 139—Surface soil, sent by John Anderson, of Orange; taken from place of Lotspeich & Anderson, near the foot-hills north of Orange Center.
- No. 140—Foot-hill soil, sent by John Anderson, Orange; taken from place of Cuddebuck, near foot-hills north of Orange.

VENTURA COUNTY.

- No. 21—Alkali soil, sent by L. B. Benchley, Hueneme. (For analysis of the alkali of this soil see p. 37.)
- No. 165—Adobe soil, from Rancho Viejo, Upper Ojai Valley; taken to ten inches depth; collected June 13th, 1879.
- No. 166—Light surface soil, from Rancho Viejo, Upper Ojai Valley; taken to depth of ten inches; collected June 13th, 1879.
- No. 168—Surface soil, from the lower bench, Blanchard's orange orchard, Santa Paula; taken to the depth of twelve inches; collected June 11th, 1879.
- No. 169—Surface soil, from the upper bench, Blanchard's orange orchard, Santa Paula; taken to twelve inches depth; collected June 11th, 1879.
- No. 182—Reddish mountain soil, from Blanchard's place, Santa Paula; depth, twelve to thirty inches.

SANTA BARBARA COUNTY.

- No. 170—Hill-side subsoil, from Hollister Ranch, near Santa Barbara; called "poison soil," from the stunting or dying out of orchard trees when their roots reach it.

SAN LUIS OBISPO COUNTY.

- * No. 22—Upland soil, taken from the hills near Newsom's Springs, by D. F. Newsom.
- * No. 23—Bottom soil, taken from about the middle of Arroyo Grande bottom, by D. F. Newsom.
- * No. 24—Bottom subsoil, taken from the middle of Arroyo Grande bottom, by D. F. Newsom.
- * No. 208—Adobe soil, sent by Mr. R. Pollard, San Luis Obispo; depth, twelve inches.

MONTEREY COUNTY.

- * No. 73—Sandy loam soil, sent by Edward Berwick, Carmel Valley.
- * No. 74—Sandy loam subsoil, sent by Edward Berwick, Carmel Valley.
- * No. 75—"White rock soil," sent by Edward Berwick, Carmel Valley; taken to a depth of three inches.
- * No. 76—White rock forming subsoil of preceding, sent by Edward Berwick, Carmel Valley.

TULARE COUNTY.

- * No. 34—"Hard-pan subsoil," sent by D. H. Rice, of Tipton; subsoil of No. 35.
- * No. 35—Tulare plains soil, sent by D. H. Rice, of Tipton.
- * No. 60—Tulare alkali soil, sent by F. G. Jefferds, Farmersville, Tulare Valley; taken to a depth of twelve inches.
- * No. 61—Tulare alkaline subsoil, sent by F. G. Jefferds, Farmersville; taken to a depth of one to two feet.
- * No. 62—"Alfilerilla soil," sent by F. G. Jefferds, Farmersville; depth, nine inches.
- * No. 77—"Dry bog land," Tulare Lake, sent by E. R. Thomason. Just reclaimed by levee; taken twelve inches in depth. (For analysis of this soil see pp. 27 and 28.)

MERCED COUNTY.

- No. 18—Merced bottom alkali soil, sent by Erastus Kelsey, Merced Falls.
- No. 19—Merced bottom alkali soil, sent by E. Kelsey, Merced Falls.
- No. 189—Upland soil, from rolling, sandy land, between Dry Creek and Tuolumne River; S. 16, T. 33, R. 14 E.; vegetation, dog's tail grass, and tar-weed; taken to depth of ten inches.
- No. 191—Foot-hill soil, obtained from foot-hills north of Merced Falls; S. 28, T. 4 S., R. 15 E.; taken to a depth of nine to ten inches; growth, blue oak, grass (*Nardus*).
- No. 192—Bottom soil, Black Rascal Creek, one mile north of Merced City; taken ten inches deep.

No. 193—Surface soil, taken to the depth of twelve inches, from the level land at Mr. Huffman's ranch, five miles north of Merced City.

No. 194—Gravelly hog-wallow soil, from a point eleven miles north of Merced; taken to a depth of ten inches.

No. 195—Bottom soil, from a cultivated field, in a valley two miles south of Merced River, on the Hopeton and Merced road; taken to ten inches in depth.

No. 196—Hog-wallow bog soil, from a point south of Merced River, eleven miles north of Merced; taken to eight inches in depth.

No. 197—Sandy upland soil, from second bench, Merced Valley; located in S. 5, T. 5 S., R. 15 E.; taken at a depth of twelve inches.

No. 198—Merced River bottom soil, from W. A. Grade's ranch, R. 13 E., T. 55; depth, twelve inches.

No. 199—Sediment soil, from Bear Creek, Merced City.

STANISLAUS COUNTY.

No. 85—Sandy soil, sent by J. T. Dunn, Turlock; taken four miles west of Turlock, and seven miles from the San Joaquin River.

TUOLUMNE COUNTY.

* No. 63—"Red" loam soil, sent by John Taylor, Mount Pleasant, near Chinese Camp; taken one mile above Sonora.

* No. 64—Valley soil, sent by John Taylor, Mount Pleasant, near Chinese Camp.

No. 65—"Red" soil (apparently light loam), sent by J. Taylor, Mount Pleasant; taken from Rolph's farm, near Sonora.

* No. 66—Red loam subsoil, sent by J. Taylor, Mount Pleasant; subsoil of No. 65.

* No. 67—"Mining slum" soil, sent by John Taylor, from near Chinese Camp; taken from the bank of a creek.

* No. 68—Valley adobe soil, sent by John Taylor, Mount Pleasant; it underlies the "mining slum" soil, No. 67. (For analyses of Nos. 67 and 68 see pp. 26 and 27.)

* No. 69—Valley soil, sent by J. Taylor, Mount Pleasant; garden soil, from Goodwin's farm.

* No. 70—Valley subsoil, sent by J. Taylor, Mount Pleasant; subsoil of No. 69.

* No. 71—Limestone soil, from limestone range, near Mount Pleasant; sent by John Taylor

* No. 72—Limestone subsoil, subsoil of the above; sent by John Taylor, Mount Pleasant.

* No. 190—Red foot-hill soil, taken from slopes near Lagrange; collected October 15th, 1879.

PLACER COUNTY.

No. 49—Red surface soil, taken by W. S. Prosser, near Auburn, to the depth of six inches. (For analysis of this soil see p. 21, of the present report.)

No. 51—Subsoil of No. 49, taken from the depth of six to that of twelve inches, by the same.

No. 50—Under subsoil of No. 51, taken from the depth of twelve to that of twenty-one inches, by the same.

No. 48—"Rotten slate," underlying soil stratum, and more or less intermixed with all its parts; taken and sent by the same.

SAN JOAQUIN COUNTY.

No. 6—Black adobe soil, sent by D. A. Learned of Stockton. (For analysis of Nos. 6 and 7, see previous report, pp. 41 and 42.)

No. 7—Adobe subsoil, sent by D. A. Learned of Stockton; taken at a depth of four feet from the surface. (For analysis of Nos. 6 and 7, see report for 1877, pp. 41 and 42.)

No. 8—Loam soil, non-alkaline, from farm of W. L. Overhiser, four miles northeast of Stockton; taken to a depth of twelve inches from surface.

No. 12—Subsoil of above, from same locality; taken from twelve to eighteen inches.

No. 9—Alkali soil, from same locality as Nos. 8 and 12; twelve feet distant; taken to the depth of ten inches.

No. 11—Subsoil of the above, taken from the depth of ten inches to eighteen inches. (For analysis of Nos. 8 and 9 see p. 37, of present report.)

No. 20—Alkali soil, from Curtis' ranch, near Stockton. (For analysis of this alkali, see p. 37, of present report.)

No. 90—(Faintly) alkaline soil, sent by J. D. Hoffman, Woodbridge; taken three miles below the town.

No. 91—Subsoil, sent by J. D. Hoffman, Woodbridge; subsoil of No. 90.

No. 143—Surface soil, sent by D. A. Learned, Stockton; from the farm of George Gray, three miles north of Stockton.

* No. 144—Subsoil, sent by D. A. Learned, Stockton; subsoil of No. 143.

* No. 145—Surface soil, sent by D. A. Learned, Stockton; taken at "Poland House."

* No. 146—Surface soil, sent by D. A. Learned, Stockton; from the farm of W. O. Robinson, eleven miles east of Stockton.

* No. 147—Subsoil, sent by D. A. Learned, Stockton; subsoil of No. 146.

* No. 148—Black adobe soil, sent by D. A. Learned, Stockton; from a point two miles southeast of the city.

* No. 149—Marly subsoil, sent by D. A. Learned, Stockton; subsoil of No. 148.

* No. 150—Surface soil, sent by D. A. Learned, Stockton; from the farm of W. O. Robinson.

* No. 151—Subsoil sent by D. A. Learned, Stockton; subsoil of No. 150.

* No. 152—Under subsoil, sent by D. A. Learned, Stockton; from the farm of George Gray, three miles north of Stockton; under subsoil of No. 143; taken at a depth of twenty-four to thirty inches.

* No. 153—Under subsoil, sent by D. A. Learned, Stockton; under subsoil of No. 143; taken at a depth of thirty to thirty-six inches.

* No. 154—Marly hardpan, sent by D. A. Learned, Stockton; taken from a point two miles southeast of the city.

* No. 155—Gravelly subsoil, sent by D. A. Learned, Stockton; found in large quantities two and three miles southeast of Stockton, and twelve miles from the nearest hill.

No. 157—Black adobe soil, sent by D. A. Learned, Stockton; taken at a depth of four feet from the surface.

No. 158—Adobe subsoil, sent by D. A. Learned, Stockton; taken seven feet from the surface.

No. 159—Stockton loam soil, sent by D. A. Learned, Stockton; depth, one foot.

No. 160—Sediment from the overflow of Mormon Channel, near Stockton; sent by D. A. Learned.

No. 161—Surface soil, sent by D. A. Learned, Stockton; taken from Section 14, four miles north of Stockton.

No. 162—Sedimentary surface soil, sent by D. A. Learned; taken from the Curtis farm, near Calaveras River, two miles north of Stockton.

No. 163—Yellow clay, sent by D. A. Learned, Stockton; came from the East Street Canal, seven feet below the surface.

No. 164—Yellow clay, sent by D. A. Learned, Stockton; taken from the bed of Mormon Channel, seven feet from the surface, two miles east of the city.

SAN MATEO COUNTY.

No. 37—"Valley soil," sent by W. G. Thompson, of Pescadero. The sample was taken from a valley between the Pescadero and Brentano Creeks.

No. 38—"Hill-top soil," sent by W. G. Thompson, of Pescadero; taken from a level hill-top, 900 feet above the sea level, about three miles from Pescadero.

SANTA CLARA COUNTY.

No. 16—Alkali soil, from near San José, sent by the editor of the California Agriculturist. The soil was collected by Mr. P. Herold, just north of the city limits, upon a low, alkaline spot between Coyote and Guadalupe Creeks. (For analysis, see p. 48, report of 1877.)

ALAMEDA COUNTY.

No. 1—Adobe subsoil, from the University Campus, in the rear of Cottages 3 and 4, between the depths of twenty-two and thirty inches.

No. 2—Adobe surface soil, taken from the University Campus, in the rear of Cottages 3 and 4, at a depth of twelve to twenty-two inches.

(For analysis of Nos. 1 and 2, see p. 37 of report for 1877.)

No. 3—Adobe surface soil, taken from the University Campus, in the rear of Cottages 3 and 4, to a depth of twelve inches.

No. 4—Adobe ridge subsoil, taken from the plots on the University Campus; depth, ten to twenty inches. (For analysis, see p. 39, previous report, for 1877.)

No. 5—Adobe ridge surface soil, taken from the plots on the University Campus; depth, ten inches.

No. 167—Adobe soil, from the flat near the shoe factory, West Berkeley; depth taken, twelve inches.

CONTRA COSTA COUNTY.

* No. 25—Ash of tule soil, from "round bulrush land," sent by Sherman Day, from Bacon Island. When the furrow, four or five inches deep, is plowed in this land, the mixed soil and roots, thrown up into ridges, is left to dry, and there burned. These are the ashes referred to.

* No. 26—"Sod" from "round bulrush land," sent by Sherman Day, from Bacon Island. It is a sod which has been exposed to the air on a levee for four years. Intended to show the slowness of decomposition in these "coarse soils."

* No. 27—Tule subsoil, from "round bulrush land," sent by Sherman Day, from Bacon Island; taken at a depth of four to five inches.

* No. 28—Tule soil, from "round bulrush land," sent by Sherman Day, from Bacon Island; taken at a depth of four to five inches.

* No. 29—Tule sod, from "float land," sent by Sherman Day, from Bacon Island.

No. 78—Black adobe soil, taken from a point two miles north of Walnut Creek.

No. 79—Black adobe soil, taken at the foot of Mount Diablo, near General Colton's residence.

No. 156—Hill-side adobe soil, taken from N. N. Jones' valley, near Lafayette.

No. 118—Adobe surface soil, taken from Pinole Valley, near Martinez' ranch.

MARIN COUNTY.

No. 200—Upland soil, sent by Mr. O. Hubbell, Tomales.

The following soils from Novato Meadows, near San Rafael, were selected and forwarded by Mr. J. B. Christensen, as representative of the reclaimed and unreclaimed marsh lands of that region:

- No. 211—Surface soil.
- No. 212—Surface soil, near the upland.
- No. 213—Surface soil, from a marsh.
- No. 214—Surface soil from low marsh land.
- No. 215—Surface soil, from the large ponds near the hills.
- No. 216—Surface soil, from the salt ponds.
- No. 217—Surface soil, from the peat lands.
- No. 218—Subsoil, from the reclaimed marsh.
- No. 219—Average surface soil, from the unreclaimed marsh.
- No. 220—Subsoil from the unreclaimed marsh.

SONOMA COUNTY.

*No. 119—Surface soil, sent by G. N. Whitaker, Santa Rosa; taken from the farm of N. Carr, eastern part of Bennett Valley.

*No. 120—Subsoil, sent by G. N. Whitaker, Santa Rosa; subsoil of No. 119.

*No. 121—Surface soil, sent by G. N. Whitaker, Santa Rosa; taken from the farm of J. De Turk, in eastern part of Bennett Valley.

*No. 122—Surface soil, sent by G. N. Whitaker, Santa Rosa; taken from the farm of H. Holmes, four miles north of Santa Rosa.

*No. 123—Surface soil, sent by G. N. Whitaker, Santa Rosa; taken from the farm of A. J. Mills, in northwest part of Bennett Valley.

*No. 124—Material underlying subsoil No. 123, sent by G. N. Whitaker, Santa Rosa.

*No. 125—Surface soil, sent by G. N. Whitaker, Santa Rosa, from his own farm.

*No. 126—Subsoil of No. 125, sent by G. N. Whitaker, Santa Rosa.

*No. 127—Under subsoil, sent by G. N. Whitaker, Santa Rosa; underlying subsoil of No. 125.

*No. 128—Surface soil, sent by G. N. Whitaker, from Bennett Valley.

*No. 129—Bog deposit, sent by G. N. Whitaker, Bennett Valley; found in a gulch and taken from a point seven feet below the surface.

No. 183—Red loam soil, from the foot of Sonoma Mountains, Mr. G. F. Hooper's place.

No. 184—Sonoma Valley soil, from a vineyard in level of Sonoma Valley, Mr. G. F. Hooper's place.

No. 185—Bottom soil, from a vineyard near Sonoma Creek, Mr. G. F. Hooper's place.

No. 186—Red surface soil, second bench of Sonoma Valley, Mr. G. F. Hooper's orange orchard.

No. 187—Gray adobe, west side of Sonoma Valley, Mr. G. F. Hooper's place.

No. 188—Red mountain soil, from a vineyard on Sonoma foot-hills, three miles north of Mr. G. F. Hooper's place.

Nos. 209, 210—Vineyard soils, from east side of Sonoma Valley, sent by Mr. R. A. Poppe.

NAPA COUNTY.

No. 84—"Mountain land" soil, sent by John Mavity, St. Helena.

No. 176—Light soil, sent by T. S. Hittell, from Howell Plateau, "Well No. 2."

No. 177—Specimen sent by T. S. Hittell, from "Well No. 3," Howell Plateau.

No. 178—Specimen sent by T. S. Hittell, Howell Plateau; the spot not designated.

No. 179—Specimen sent by T. S. Hittell, Howell Plateau; the spot not designated.

SOLANO COUNTY.

*No. 53—Ridge soil, from near Vallejo, sent by G. C. Pearson.

*No. 54—Valley adobe soil, from near Vallejo, sent by G. C. Pearson.

*No. 55—Sandstone ridge soil, from near Vallejo, sent by the same. This soil is from a hill and overlies a vein of sandstone.

*No. 56—Siliceous sandstone, sent by the same; from the ridge east of the city. It underlies No. 57.

*No. 57—Indurate calcareous clay, sent by G. C. Pearson, Vallejo. It is the general bed-rock of the district, underlying Nos. 53, 54, and 55.

*No. 96—Alluvial soil, sent by S. G. McMahon, Dixon. Taken from south bank of Putah Creek, at the Rancho Rio de Los Puntos, just at the point of crossing of Mount Diablo meridian.

*No. 97—Alluvial subsoil, "subsoil" of the above, from same place.

*No. 98—Alluvial deposit, sent by S. G. McMahon, of Dixon; taken at a depth of seven feet, from south bank of Putah Creek, two miles east of Mount Diablo meridian.

*No. 99—Alluvial deposit, sent by S. G. McMahon, Dixon. The sample was taken from the south bank of Putah Creek, two miles east of the Mount Diablo meridian, at a depth of fourteen feet from the surface.

*No. 100—Tufaceous concretions, sent by S. G. McMahon, Dixon. Said to be "native rock" formed at a depth of seven to twenty feet.

*No. 107—Putah Valley soil ("A, 1"), sent by J. M. Dudley, Dixon. (All the "A" samples come from the same hole, on the highest land near the arroyos.) Depth, twelve inches.

*No. 108—Putah Valley subsoil ("A, 2"), sent by J. M. Dudley, Dixon. Subsoil of No. 107; depth, twelve to twenty-two inches.

*No. 109—Putah Valley under subsoil ("A, 3"), sent by J. M. Dudley, Dixon. Depth, twenty-two to thirty-two inches.

*No. 110—Putah Valley soil ("B, 1"), sent by J. M. Dudley, Dixon. (The "B" samples represent land two to three feet lower than that represented by "A 1" and "C," and is further removed from the arroyos.)

*No. 111—Putah Valley subsoil ("B, 2"), sent by J. M. Dudley, Dixon. Subsoil of No. 110.

*No. 112—Putah Valley soil ("C, 1"), sent by J. M. Dudley, Dixon. Taken from the highest land near arroyos.

*No. 113—Putah Valley subsoil ("C, 2"), sent by J. M. Dudley, Dixon. Subsoil of No. 112.

*No. 114—Putah Valley under subsoil ("C, 3"), sent by J. M. Dudley, Dixon. Under subsoil of No. 112.

*No. 115—Putah Valley soil ("D, 1"), sent by J. M. Dudley, Dixon. (The class of soil represented by "D" samples is of rare occurrence, existing only in patches. It is called "adobe" and is found farthest from the arroyos, and is the lowest land.)

*No. 116—Putah Valley subsoil ("D, 2"), sent by J. M. Dudley, Dixon. Subsoil of No. 115.

*No. 117—Stiff clay, underlying the soils of Putah Valley, sent by J. M. Dudley, Dixon. Brought up in boring for water.

YOLO COUNTY.

*No. 92—"Red adobe soil," sent by Mr. Seshmeiser, Davisville; taken two miles north of Putah Creek and three miles east of Mount Diablo meridian.

*No. 93—Surface soil, sent by Mr. Seshmeiser, Davisville; taken four miles north of Putah Creek, near Mount Diablo meridian.

*No. 94—Surface soil, sent by Mr. Seshmeiser, Davisville; taken four miles north of Putah Creek and two miles east of Mount Diablo meridian.

*No. 95—"Black adobe" soil, sent by Mr. Seshmeiser, Davisville; taken four miles north of Putah Creek and one mile east of Mount Diablo meridian.

*No. 141—Vineyard soil, sent by R. B. Blowers, Woodland; taken from a point five miles south of Cache Creek.

*No. 142—Vineyard subsoil, sent by R. B. Blowers, Woodland; the subsoil of No. 141.

SACRAMENTO COUNTY.

*No. 10—Sacramento sediment soil, deposited along the banks of the river, sent by D. Flint, Sacramento. (For analysis of this soil see pp. 24 and 25, of the present report.)

*No. 52—Upland or "red land" soil, sent by George Rich, Sacramento.

*No. 58—Sacramento bottom soil, sent by D. Flint, Sacramento; taken at a point five and one-half miles from Sacramento, near the Upper Stockton Road.

*No. 59—Sacramento second bottom soil, sent by D. Flint, Sacramento; it was taken one-half mile from the river, between the river and the tules.

COLUSA COUNTY.

*No. 101—Hill adobe soil, sent by John Anderson, Kanawha; taken from the ranch of E. LeGrande.

*No. 102—"Hill adobe" subsoil, sent by John Anderson, Kanawha; subsoil of No. 101.

*No. 103—"Hill adobe" soil, sent by John Anderson, Kanawha; taken from the ranch of U. S. Clark, Clark's Valley, nine miles from Kanawha.

*No. 104—"Hill adobe" subsoil, sent by John Anderson, Kanawha; subsoil of No. 103.

*No. 105—"Valley adobe" soil, sent by John Anderson, Kanawha; from the ranch of J. A. Towl, three miles east of Kanawha.

*No. 106—"Valley adobe" subsoil, sent by John Anderson, Kanawha; subsoil of No. 105.

BUTTE COUNTY.

*No. 171—Adobe surface soil, sent by L. D. Morse, Chico; taken from the farm of J. J. Waste, three miles northwest of Chico.

*No. 172—Adobe surface soil, sent by L. L. Morse, Chico; taken from the "Crouch Ranch," five miles south of Chico.

*No. 173—Light surface soil, sent by L. L. Morse, Chico; taken from the "Kempf Ranch," near the south limit of the city.

*No. 174—Surface soil, sent by L. L. Morse, Chico; taken from B. Stronge's farm, one mile east of Chico.

*No. 175—Adobe soil, sent by L. L. Morse, Chico; taken from "Garner Ranch," five miles northwest of Chico.

HUMBOLDT COUNTY.

- * No. 36—Bottom soil, sent by J. O. Dinsmore, of Rohnerville: taken from Eel River bottom.
 * No. 80—Table land soil, sent by Jackson Sawyer, Table Bluff.
 * No. 81—Table land subsoil; subsoil of No. 80, sent by J. Sawyer, Table Bluff.
 * No. 82—Sandy claystone, sent by Jackson Sawyer, Table Bluff; from Eel River.
 * No. 83—Sandy clay, sent by Jackson Sawyer, Table Bluff; from Salmon Creek.
 Nos. 201, 202, 203, 204, 205, 206, 207—Soils from Humboldt County which have not been fully reported on by the sender, Mr. Alex. Waddington, Ferndale.

LIST OF SOILS FROM OREGON.

[Furnished and presented by the Land Department of the Oregon and California Railroad, through Mr. P. Schultze, Portland.]

- No. 300—Soil from Marion County.
 No. 301—Natural soil, two and one-half miles east of Portland.
 No. 302—Marks Prairie, Clackamas County.
 No. 303—Upland soil, Clackamas County.
 No. 304—From Beaver Dam, Clackamas County.
 Nos. 305, 306, 307, 308, 309—Soils from Albany.
 No. 310—From the farm of Mr. George Bailey, Lane County.
 No. 311—From the farm of Mr. W. C. Edwards, east of Junction, Lane County.
 No. 312—From the farm of Mr. John Brown, near Eugene City, Lane County.
 Nos. 313, 314, 315—From near Halsey.
 No. 316—Bottom land, near mineral spring, northeast corner Marion County.
 No. 317—Ridge Fern, Marion County.
 No. 318—Found on the prairies back of the river at Jefferson.
 No. 319—"Santian Bottom" land, near the river at Jefferson.
 No. 320—From the oak grub land, on the ridges at Jefferson.
 No. 321—From bottom land.
 No. 322—From hill land, near Droin.
 No. 323—Beach land, near Droin.
 No. 324—From foot-hill land, farm of Mrs. E. Weber, near Goshen.
 No. 325—From Harrisburg.
 No. 326—From suburbs of Salem.
 No. 327—From the farm of Mr. F. Shedd, near Shedd's Station, Linn County.
 No. 328—From high land.
 No. 329—From side of mountain, near Comstock.
 No. 330—From low, flat land, near Comstock.
 No. 331—From Marion County.
 No. 332—From low land.
 No. 333—From river bottom land, farm of Mr. W. Gainey, Goshen.
 No. 334—From west part of Lane County, near the Coast Range Mountains.
 No. 335—From Lane County.
 No. 336—From fork of Willamette and Mackenzie Rivers.

SANDWICH ISLANDS.

- No. 180—Surface soil, taken from Kau District, Hawaii, at an elevation of 2,500 feet.
 No. 181—Subsoil of No. 180.

IV. ANALYSES OF ROCKS, MARLS, CLAYS, WATERS, ETC.

Sandy shell marl from near Antioch, Contra Costa County; sent by Mr. Geo. F. Cruikshank, for information as to its fitness for the improvement of soils.

It is a rough, yellowish mass, easily pulverized, and contains a large number of shells of the cretaceous period. Its composition was as follows:

Carbonate of calcium.....	51.17
Iron peroxide and alumina	4.66
Sand and fine siliceous.....	38.48
Moisture and combined water.....	5.69
	100.00

The material also contains small amounts of phosphoric acid and potash, but not enough to render it desirable as a source of supply for these. The green particles contained in it are not "greensand," but grains of a greenish rock. It is well adapted to the improvement of the heavy "yellow adobe" soils, so common on the slopes of the coast range; and could be applied to these without stint, to the extent of 400 to 600 bushels per acre.

"Chalk," from *Riverside, San Bernardino County*; sent by Mr. H. J. Rudisill. Specimen taken from a belt of so-called tertiary formation lying along the foot of the San Bernardino Mountains. A soft, chalky, yellowish-white mass, effervescing strongly with acids.

Its examination was desired with a view to its use in the manufacture of hydraulic cement, for use in the construction of irrigating ditches. The examination resulted as follow:

Insoluble matter, chiefly clay	13.17
Carbonate of calcium (lime), and some magnesia	86.83

This material would, therefore, make, in burning, a lime with slightly hydraulic properties, but in order to make a strong cement, would require the admixture of some clayey material previous to burning.

The two following materials were analyzed at the request of Mr. Julian LeConte, of the United States River and Harbor Survey, also with a view to determining their adaptability to the manufacture of hydraulic cement for use in the harbor improvements on the bay.

Impure limestone, or marlstone, from a cut on the Bay and Coast Railroad, in the Santa Clara Mountains. A rather hard, dirty white, somewhat porous rock, probably tufaceous.

The analysis gave:

Carbonate of calcium (lime)	88.75
Fine silice	3.06
Sand	5.17
Iron Peroxide, alumina, etc.	1.56
	<hr/> 100.00

This rock, by itself, will make a fair building lime, without hydraulic properties. It seems to occur abundantly.

Alluvial clay, from Alger's Bend, Feather River; sent by Mr. Julian LeConte, January 1st, 1878.

Sample, as received, is a compact, light-brown lump, smooth to the touch; crushes easily between the fingers to an impalpable powder; apparently very homogeneous throughout.

The dried clay showed the following composition:

Insoluble residue (sand and silica)	59.265 per cent.
Soluble silica	19.513 per cent.
Ferric oxide	7.268 per cent.
Alumina	21.946 per cent.
Lime	0.505 per cent.
Magnesia	0.696 per cent.
Chemically combined water	9.916 per cent.
	<hr/> 99.596

This clay, which may be considered as a sample of the finest slickens of the hydraulic mines, is remarkable for the ease with which the treatment with acid has dissolved out a large amount of alumina; just as was the case in the Sacramento sediment soil (No. 10), the

analysis of which is given above. It will probably yield a very easily burnt and rapidly setting cement when properly treated.

This material is reported as forming, after exposure to the sun, great gaping sun-cracks, thus splitting up into large blocks, which, when dry, are somewhat used as building-stone in the neighborhood.

Unfortunately, the amount of phosphates and potash present in this sediment were not at the time determined, but this will be done hereafter.

Siliceous claystone, from a rocky point on San Francisco Bay, between Berkeley and San Pablo.

This material had been brought forward as a source of phosphates for agricultural purposes, and was hence examined in that direction. It proves to be very rich in infusorial shells, but contains only a scarcely appreciable amount of phosphates, as might be expected. At some points it is traversed by veins of calcareous spar; these were supposed to be phosphorite, or phosphate of calcium, of which they do not contain a trace. About a teaspoonful of what purported to be "bone phosphate," extracted from this deposit by a San Francisco chemist, was found to be roasted Epsom salt.

Mineral specimens from San Diego; sent by Mr. G. W. Barnes, President of the San Diego Society of Natural History, August 21st, 1878 (at the suggestion of Professor E. S. Carr), for determination of their character.

Nos. 1 and 2 are from the same spot on the margin of a small stream, but little above high water-mark, one overlying the other, on the farm of Mr. J. S. Harbison, twenty-five miles east of this place.

No. 1 is a greenish-yellow coarse powder, easily crushed between the fingers to a fine powder. The substance contains a small amount of alumina, but is mainly a persulphate of iron, resulting from oxidation of ferrous sulphate.

No. 2 is a grayish, coarse powder, underlying No. 1, and supposed to be of similar composition. It consists of ferrous sulphate with some sand and quartz, as before.

No. 3 is from Soledad Valley, in the side of a bluff, a few feet above high tide.

No. 3 is a sample very much like No. 1, having a little darker yellow tint, and one large easily pulverizable lump. Evidently it is the same as No. 1, and like it, has been formed by the oxidation of iron pyrites in the rock.

No. 4 crops out abundantly near the summits of our hills; this specimen was taken from a road grade near the Old Mission.

It is a soft, gritty clay-sandstone, doubtless belonging to some of the tertiary strata of the region; contains no sensible amount of carbonate of lime.

No. 5 crops out of the side of the mesa in the limits of the City of San Diego, sixty or seventy feet above sea level.

This is a marlstone, probably of the same age substantially as No. 4. It contains about 62 per cent. of carbonate of lime, and where convenient, would doubtless form a valuable addition to the heavier soils of the region, the more as it contains a sensible amount of phosphates.

EXAMINATION OF MATERIALS FOUND IN A DRIFT MADE FOR COAL IN
THE COAST RANGE, NEAR OAKLAND, BY MESSRS. TUBBS AND WALKER.

The opportunity afforded by this drift for an examination of the unaltered materials composing a large portion of the range was taken with a view to ascertaining some general points in their composition, as bearing upon the soils formed from them.

I—*Gray plastic clay*; examined for magnesium to test the question of possible metamorphosis into talcose rocks. An unusual quantity (estimated at from six to eight per cent.) was found to be present.

II—*Crystalline crust filling veins in I*; found to consist solely of carbonate of lime, or calcite.

III—*Light, frothy iron ochre*, occurring in crevices; tested for sulphuric acid, but none found; nearly pure limonite ore.

IV—*Yellow, powdery mineral*, filling veins and cleavage planes; supposed to be jarosite, or "misy" (double sulphate of iron and potassium); contains abundance of sulphuric acid and iron, and considerable potassium. The presence of this mineral—which is doubtless still in process of formation—seems to indicate that the water circulating in these materials contains potash salts in solution; hence the supply of that ingredient in the soils formed from them is doubtless ample.

ANALYSES OF WATERS.

Water from the artesian well at the Alvarado Sugar Works; examined at the request of Mr. E. Th. Gennert, to ascertain its fitness for use in the operations of the factory.

Water clear; no special taste or odor; solid contents, 22.5 grains per gallon, of which nearly half remains insoluble after evaporation, and consists of the carbonates of lime and magnesia, some silica, and traces of phosphates. The soluble part is mainly sulphate of sodium (Glauber's salt), amounting to about thirteen grains per gallon.

This is a very hard water, and on account of its soluble salts may disagree with some persons for daily use, yet is hardly too strong for most manufacturing purposes.

Water from an artesian well near Cressy, Merced County; sent by Mr. J. S. Pike; comes from a depth of 281 feet; slightly salty in taste. The well supplies a large stream, which, however, kills all vegetation and cannot thus be used for irrigation, for which it was designed.

It contains 4.28 grams per liter, or 312 grains per gallon, of solid matter, consisting mainly of the chlorides and sulphates of sodium and magnesium, and some lime and potash salts, a little iron and silica, dissolved in free carbonic acid gas. The water is entirely too mineral for any ordinary purposes, but might be beneficial as a mineral water.

Residue from water of a spring in the San Bernardino Mountains; sent September 20th, 1878, by Mr. A. B. Farres.

Mr. Farres says it is "claimed to be valuable for healing purposes, and said to cause vomiting by taking only a tablespoonful. On boiling to dryness, this water leaves about half a pound of material per gallon." Analysis shows the residue to consist mainly of common salt, with considerable alkaline carbonates and some sulphates, and a trace of phosphoric acid. Being a pretty strong *brine*, it is not surprising that a small quantity should cause vomiting.

Mineral water from near Oroville; sent by O. M. Enslow.

The water, which supplies a large pond, issues from a spring about five miles northeast of Oroville, Butte County. Bubbles of gas in great abundance issue at the spring. A black deposit covers the ground over which this water flows. All animals, especially cattle and horses, are very fond of the water, and even eat the black deposit above referred to.

The stream flowing from the spring is constant all the year, neither increasing or diminishing.

The sample, from which a black deposit had separated, came in a sealed bottle. On opening, a distinct odor of sulphydric acid was detected, and a very perceptible taste of "sulphuric water" was observable.

The black deposit proves to be chiefly sand grains and silica, colored with considerable sulphide of iron, doubtless held in solution, originally, as carbonate. Solid contents, .808 grams of solid matter per liter, or 47 grains per gallon.

These consist mainly of common and Glauber's salt (chloride and sulphate of sodium) and carbonate of lime, together with silica; also, some gypsum, and carbonates of iron and magnesia. It is, therefore, a saline chalybeate, and, doubtless, beneficial as well as agreeable to cattle.

"Barker Spring" water from Rio Bravo Ranch, Kern County.

The water was clear, and possessed no peculiar taste or smell. Contains 17.99 grains of solid matter per gallon, which consists of chloride and sulphate of sodium in considerable quantities; organic matter, magnesium and iron, in small quantities.

Water from a well in the Town of Berkeley, near the railroad depot; suspected of injurious qualities on account of diphtheria having prevailed among its users.

The water is clear and free from taste or odor. Solid contents, 16.3 grains per gallon, of which 3.57 remained undissolved after evaporation, being carbonates of lime and magnesia, with silica.

The soluble portion, amounting to 12.7 grains, showed substantially the same composition as the water of the University reservoir, previously analyzed (report, 1877, p. 49), viz.: the chlorides, sulphates, carbonates, and silicates of sodium, and potassium, with some lime and magnesia; a very small amount of organic matter, and no nitrates; thus showing the absence of any injurious ingredients or sewage contamination, and that the disease, if it originated from local causes at all, had no connection with the well water, which is excellent.

V. EXAMINATIONS AND ANALYSES OF AGRICULTURAL PRODUCTS.

INVESTIGATION OF WATERMELONS.

The practicability of manufacturing sugar from melons has often been discussed, and varying opinions on the subject have been put forth, based, doubtless, upon the varying results obtained in different climates and soils. Both watermelons and muskmelons have been actually used for the manufacture of sugar in western Europe; but the fact that the industry has never assumed important proportions seems to indicate that it is subject to special difficulties. On the whole, it is well understood that the sugar contained in fruits is predominantly of the non-crystallizable kinds, viz., grape and syrup sugars rather than cane sugar; yet the latter is very generally present, and in varying proportions according to circumstances, even in the same fruit.

The facility with which watermelons especially may be grown in the warmer portions of the State, their fine quality, and great abundance, so as to be frequently a drug in the market, forcibly suggests that if it be possible to use them in the manufacture of sugar or syrup, it might prove a profitable industry, since it could be carried on on a small scale by farmers with very little outlay for appliances, for the juice of the watermelon is easily obtained, and is so nearly free from the impurities which render the working of beet juice troublesome and expensive, that little if any purification ("defecation") would be likely to be needed before evaporation.

Upon a suggestion made in August of the present year, through the columns of the *Rural Press*, by Mr. H. Hutchins, of Lodi, San Joaquin County, a full investigation of the subject was determined upon, and the material therefor was furnished by Mr. Hutchins, in the shape of a crate of fine melons, about the middle of September. The melons were of two varieties: one long, with thin rind and yellow seeds, red-fleshed, and very sweet; the other roundish and short, with thicker rind and firmer pulp, not quite so sweet to the taste. Seven melons altogether were examined, a record being kept of their respective weights, form, degree of ripeness, etc.; and in Nos. 1 and 2, considered as representative samples, respectively, of the long and round varieties, the proportion of the rind to pulp and kernels was determined:

Melon No. 1—Long, thin rind, white seed, fully ripe.

Melon No. 2—Short, roundish, thick rind, moderately ripe, black seed.

Melon No. 3—Like No. 1, black seed, slightly over-ripe.

Melon No. 4—Like No. 2, smaller, very ripe.

Melon No. 5—Like No. 3, but quite under-ripe.

Melon No. 6—Like No. 2, but fully ripe.

Melon No. 7—Like No. 1, smaller, rather green.

TABLE
Of results of examination of watermelons.

	Weight of melons.	I—JUICE.				Total ash.
		Specific gravity.	Solid matter—per cent.	Cane sugar—per cent.	Other sugar and impurities—per cent.	
No. 1 -----	13.0 †kil.	1.039	9.75	2.71	7.04	.27 { .09 soluble. .18 insoluble.
No. 2 -----	11.75 kil.	1.035	8.8	*.823	*7.977	
No. 3 -----	5.3 kil.	1.0388	9.75	*1.97	*7.78	
No. 4 -----	7.5 kil.	1.0387	8.7	*1.4	*7.3	
No. 5 -----	7.5 kil.	1.036	9.0	2.07	6.93	
No. 6 -----	11.2 kil.	1.0345	8.625	2.42	6.205	
No. 7 -----	10.6 kil.	1.038	9.5	3.46	6.04	

* It is probable that the cane sugar determination in these cases was too low, in consequence of an error in manipulation, and should be thrown out in averaging the results.

† The kilogram is nearly 2¼ pounds.

	II—WHOLE MELON CONSISTED OF—			III—MELON PULP AFTER PRESSING JUICE.		
	Seeds—per cent.	Pulp—per cent.	Rind—per cent.	Ash—per cent.	Organic matter—per cent.	Water—per cent.
No. 1 -----	1.20	48.796	50.0	.345	6.891	92.764
No. 2 -----	1.35	35.68	62.97	.275	4.43	95.294

	IV—JUICE OF MELON RIND.				V—PRESSED PULP OF RIND.		
	Specific gravity.	Solid matter—per cent.	Cane sugar—per cent.	Other sugar and impurities—per cent.	Ash—per cent.	Organic matter—per cent.	Water—per cent.
No. 1 -----	1.022	5.7	.328	5.371	1.169	6.708	92.123

	VI—SEEDS, FRESH.		
	Ash—per cent.	Organic matter—per cent.	Water—per cent.
No. 1 -----	1.54	48.66	49.8
No. 2 -----	1.278	41.8	56.922

VII—No. 2 SEEDS, AIR-DRIED.

Husks -----	66.042 per cent.
Kernels -----	37.958 per cent.

VIII—KERNEL HUSKS, AIR-DRIED.

Ash -----	1.442 per cent
Organic matter and water -----	98.558 per cent.

The hulled kernels, by drying and extraction with boiling ether, were found to be of the following composition:

IX.

Water -----	11.212 per cent.
Oil -----	43.15 per cent.
Extracted kernels -----	45.638 per cent.

On burning the extracted kernels, they yielded 9.61 per cent. of ash, and therefore contained 90.39 per cent. of vegetable matter.

From the data given in Tables VII and IX, it appears that the air-dried melon seeds contained 15.4 per cent. of oil. This oil is pressed in the south of France, and used for the table.

As to the main point in question, it appears from Table I that the average amount of all kinds of sugar and solid matter in watermelon juice is a little over nine (9.1) per cent. on an average, but that of this amount only 2.66, or not quite one-third by weight, is cane sugar. This is far too little, in proportion to the other substances, to be made available for the manufacture of cane sugar, and the proposition to use the watermelon for this purpose is thus effectually disposed of in the negative.

Nevertheless, it appeared probable that a bright and palatable syrup, not liable to granulation, could be advantageously produced from the watermelon, especially since the amount of ash in the juice is so insignificant; but on making the experiment it was found that whether the juice be evaporated by itself and purified only by skimming, or whether it be defecated with lime, as seems most desirable, the resulting syrup was always of so very dark a tint that, although pleasant to the taste and therefore well enough adapted to home use, it would scarcely be accepted in the general market. I hope yet to devise means practicable in the family for obviating this unexpected difficulty. It is, of course, readily overcome by filtration through bone charcoal, as is done in sugar refining; but this operation is too troublesome, lengthy, and costly on the small scale, to be resorted to by housekeepers in the country.

The darkening of the syrup is obviously due to the influence of the air on some organic substance (oxidation), and not to any action of the ash ingredients, whose amount is scarcely one-half of what is found in the best beet juice.

EXAMINATION OF SUGAR BEETS AND SORGHUM.

1. *Beets from Isleton, Sacramento County*; sent by Mr. F. A. Roe, October 2d, 1877. Raised from California seed from Mr. Gwyn, Soquel, on low tule land, burnt two years. Average of the crop on fourteen acres, about fifteen and one-half long tons; on some land, twenty-three tons.

This investigation was partially reported previously, but is now given in full:

Specific gravity of the juice (by spindle).....	1.066
Amount of solid matter corresponding (if sugar).....	16.10 per cent.
Amount of solid matter by direct determination	17.51 per cent.
Percentage of cane sugar in the juice	14.69 per cent.
Purity co-efficient.....	84.
Dried beet fiber, 4.1 per cent. of the whole beet.	
Ash of fiber, 2.97 per cent. of its weight, or about 0.12 per cent. of the weight of the whole.	
Total ash percentage in the juice.....	0.58 per cent.
Insoluble part of ash.....	0.21 per cent.
Soluble part of ash	0.37 per cent.

Alkalinity of soluble ash corresponds to 0.10 of sodium oxide, which in evaporation would render 1.10 per cent. of sugar uncrystallizable.

There are contained :

	In 100 parts of solid ash.	In 100 of juice.
Oxide of potassium	43.25	.1666
Oxide of sodium	8.66	.0334
Chloride of potassium	12.81	.0494
Sulphuric acid	2.91	.0112
Phosphoric acid	9.73	.0374
Carbonic acid (by diffusion)	22.64	.0720
	100.00	.3700

The favorable judgment given of these beets in the previous report (p. 58) is thus fully sustained by the complete analysis of the ash of the juice. They are of exceptionally fine quality for sugar-making.

Other determinations of the quality of beets from the same locality have been made in succeeding years, as follows:

2. *Beets from Isleton*; received in December, 1878.

It was desired to determine the relative value of beets planted at different times during the summer. Specimen No. 1 was planted in June; No. 2 in July, 1878. The determinations gave:

Specific gravity of juice, by spindle	1.0535	1.035
Solid contents corresponding—per cent.	13.17	8.66
Total per cent. of ash in juice	1.55	1.19
Per cent. of soluble ash in juice	0.32	0.38
Alkalinity of soluble ash corresponding to SO_3 —per cent.	0.46	0.54
Amount of sugar that would be destroyed by the alkali in evaporation—per cent.	3.24	3.57

The absolute cane sugar percentage could not be determined on account of the instrument being out of order. It is, however, easily seen that these beets were both considerably inferior in quality to those previously tested, especially so as regards the sample planted in July, which, being immature, was inferior to the earlier planted, not only in the percentage of sugar, but also in containing a larger amount of total as well as of soluble ash. Practically, No. 2 would be unworkable under ordinary circumstances. As to the possible causes of the inferiority of the beets grown that year I have no information.

3. *Beet from Isleton, grown in 1879*; received in October; weight twelve ounces; crisp and in good condition.

Specific gravity of juice	1.063 at 17	per cent.
Corresponding amount of solid matter in solution	15.5	per cent.
Per cent. of cane sugar by saccharimeter, using inversion	1.40	per cent.
Hence purity co-efficient	90.03	

This, again, is a very high grade beet, with which any sugar-maker would be pleased.

Beets from Guadalupe, Santa Barbara County; sent by Mr. James Morse.

Having been three weeks on the way, they had sprouted leaves,

and fibrous roots into the soil, and were slightly wilted. The following is a summary of the results from the three specimens sent: *

	Number One.	Number Two.	Number Three.
Specific gravity of juice (by spindle) ----	1.0412	1.065	1.0295
Amount of solid matter corresponding (if sugar) -----	10.2 per cent.	15.8 per cent.	7.66 per cent.
Amount of solid matter by direct deter- mination -----	10.68 per cent.	17.06 per cent.	-----
Total ash percentage in juice -----	1.185 per cent.	1.23 per cent.	2.47 per cent.
Insoluble ash in the juice -----	0.115 per cent.	0.15 per cent.	0.11 per cent.
Soluble ash in the juice -----	1.07 per cent.	1.08 per cent.	2.36 per cent.
Percentage of coagulable albumin in juice -----	0.834 per cent.	-----	-----
Alkalinity of soluble ash neutralizes sul- phuric acid (SO ₃) -----	0.43	0.30	0.56
Per cent. of sugar destroyed in evapora- tion -----	3.60	2.50	4.60

These beets differ widely in their composition and value for sugar-making. No. 3 contains so little sugar—probably not over 6 per cent.—and so large an amount of soluble and very alkaline ash as to put it entirely out of the question. No. 1 contains an adequate amount of sugar, but also more ash than is deemed admissible, especially as it is very alkaline; moreover, it contains a very large amount of albuminous matter. No. 2 is a very good beet, containing so much sugar (probably about 14 per cent.) that even its somewhat large ash percentage would not render it unacceptable, the ash not being very alkaline.

It would have been interesting to know just in what locations and under what circumstances these beets were grown, but I have been unable to obtain the data. As the record stands it proves only that from the same seed very different qualities of beets may be grown, but these differences may be largely due to imperfect maturation, as in the beets, No. 2, from Isleton, of 1878 (see above). In the widely different climates of California, it will be necessary to determine not only the proper soils, but more especially the proper times of planting for each location, before the best possible results can be obtained.

That in general sugar beets, of unusually high quality, can be successfully grown in many regions of California has now been sufficiently proved by the tests made up to this time, as well as by the practical working of the manufacturing establishments that have been managed with a reasonable degree of business tact and technical skill. That the profitable production of beet sugar depends on a great many conditions besides that of the quality of the raw material is too well known to need discussion. The beets will not bear transportation to any distance, and, in order to render them available for sugar-making, their successful growing must, within a limited area, be coupled with cheap fuel, good and abundant water supply, and reasonably cheap and reliable labor.

It has often been attempted to free this industry from some of these restraints by rendering the beets transportable and capable of being kept all the year by *drying*. But to do this by artificial heat is so costly an operation that it can be made to pay only under peculiar

* This investigation was carried out by Mr. Walter Jones, Ph. B.

circumstances; hence, as a matter of fact, this expedient has been thus far but little resorted to.

The dry summer climate of the interior of California, however, seems to offer exceptionable facilities in this direction; for where raisins can be made successfully, cut beets can be dried without artificial heat. So far, no raisin-making country has attempted the beet sugar manufacture, hence the conditions offered here are entirely new.

At the suggestion of Mr. Ernest Th. Gennert, the well known beet sugar expert, who has been chiefly instrumental in introducing this industry East, experiments in the drying of beets in the open air were, during the past season, carried out in Southern California, and some of the beets so prepared were sent to the department for examination. One lot from near Santa Ana, Los Angeles County, by Mr. W. H. Spurgeon; the other by Mr. H. J. Rudisill, of Riverside, San Bernardino County. The following record of the progress of the drying process is given by Mr. Rudisill:

EXPERIMENT IN DRYING BEETS.

First experiment, with "Mangold Wurtzel," from Santa Ana, Los Angeles County.

DATE.	TEMPERATURE—FAHRENHEIT.			Weight of beets at 12 M.
	6 A. M.	12 M.	6 P. M.	
September 29 -----		76°	68°	100 pounds.
September 30 -----	58°	82°	73°	46 pounds.
October 1 -----	60°	85°	75°	20½ pounds.
October 2 -----	65°	90°	-----	15 pounds.

NOTE.—The first day the beets were spread upon a cloth upon the ground, when I found they did not dry as rapidly as upon a scaffolding, or platform, a few feet above the ground, where the air can circulate freely.

Second experiment, with "Sugar Beets," from Northern California.

DATE.	TEMPERATURE—FAHRENHEIT.			Weight of beets at 12 M.
	6 A. M.	12 M.	6 P. M.	
October 16 -----		79°	73°	100 pounds.
October 17 -----	55°	85°	78°	29¾ pounds.
October 18 -----	55°	85°	-----	25½ pounds.

NOTE.—A light north wind set in on the morning of the second day, and continued during the experiment.

Of the drying at Santa Ana, done about the same time, Mr. Spurgeon reports that 100 pounds were in twenty-four hours reduced to twenty-nine and one-half pounds, they having been sliced crosswise into discs, about one-half an inch thick, and spread simply on boards. These slices, when received here, were dry but pliable, and retained 20.6 per cent. of moisture, while those sent by Mr. Rudisill contained only 10.6, and would evidently have kept indefinitely, like well-dried apples. The results of their examination are given in the following table, the sugar percentage being stated both for the absolutely

dry substance* and for that containing 10.0 per cent. of moisture, as will be the case on an average in practice :

	Sugar in sugar beets, abso- lutely dry.	IN BEETS DRIED, WITH TEN PER CENT. MOISTURE.			Ash in juice, residue—per cent.
		Sugar—per cent.	Total organic matter—per cent.	Ash—per cent.	
Sugar beet, Riverside -----	68.0	63.0	86.09	3.91	5.411
Santa Ana (Mangold) -----	64.0	58.15	86.25	3.75	4.779
Santa Ana -----	62.1	55.92	-----	-----	5.218

Not having received any of the fresh material, I am unable to state precisely the original sugar percentage in the fresh beets; but a test made by Mr. Gennert gave somewhat over 12 per cent. Taking this as a basis, it will be seen that the weight of the raw material has been by drying reduced to one-fifth, thus, of course, diminishing the freight expenses in a corresponding ratio. It is obvious that a material containing from 56 to 63 per cent. pounds of sugar in the 100 will bear shipment to any moderate distance, thus rendering it possible to locate the manufactory at whatever point may, on the governing considerations, appear most desirable.

It would thus seem that in California, if anywhere, the beet sugar industry may look forward to a prosperous future; the only possible danger being the open competition of the sugar cane, both at home and abroad, with which, having the advantage of a purer juice, obtained with little trouble and expense, and yielding a merchantable syrup as its by-product, it would seem impossible for the beet to compete. It has done so elsewhere, mainly under the protection of a tariff, or (as between the East and the Sandwich Islands), under that of long transportation. While this is true, it is also indisputable that, both in California and in the East, the beet sugar manufacture has proved remunerative whenever conducted under proper management and good natural conditions; and when the drying process is brought in, enabling the manufacturer to run throughout the year, as against the sugar cane process, which is crowded into a short harvest season almost everywhere, save in the Hawaiian Islands; enabling him also to boil juices even more concentrated than that of the sugar cane, by the use of the maceration process: the balance of advantage may readily, after all, be found on the side of beet sugar industry. It seems probable, at this time, that this question will soon be practically tested, perhaps not only in California but also farther north; the high prices of sugar, and their frequent and apparently arbitrary fluctuations having called popular attention strongly to the subject.

Within the last months several samples of sugar beets have been received from parties in Washington Territory, desiring authentic information as to the quality of the beets produced by them on a small scale, thus far; and deeming the subject one of public importance to the whole Coast, these requests have been acceded to; the results being as follows:

No. 1—*Beets grown by Mr. S. M. Wait, of Dayton, Washington Territory*; one weighing about seventeen, and the other about twelve ounces; crisp and in good condition when received.

No. 2—*Sugar beet grown by Mr. E. Meeker, Puyallup, Washington Territory*; sent at the request of Mr. M. G. Marsiliot, of the United States Revenue steamer *Wolcott*, Port Townsend; weight about sixteen and a half ounces; somewhat bruised and wilted when received.

	Specific gravity of juice.	Percentage of cane sugar.	Purity co-efficient.
Number 1 -----	1.065	12.38	78.3
Number 2 -----	1.058	12.68	90.5

This is an excellent showing for the Washington beets, but it is probably not the best that can be done. Number 1 was decidedly immature as yet, as was shown by the peculiar behavior of the juice. A few weeks more growth would doubtless have greatly raised its purity co-efficient, and also its sugar percentage.

SUGAR CANE AND SORGHUM.

The culture of sugar cane has not, as yet, been carried on on a large scale in California. But numerous experiments on a small scale have shown that it succeeds well, and is of good quality in Los Angeles, San Bernardino, and San Diego Counties. Whenever grown on irrigated ground there can be little doubt that it will also succeed in a large part of the San Joaquin Valley, as, according to Mr. W. H. Sanders' experience, it does in Fresno. The extension of its cultivation, will, I think, depend more upon commercial than climatic considerations; although probably the "bay climate," as well as that of the immediate coast southward, is probably too cool to develop the saccharine juice to perfection.

Not so with the sorghum, which succeeds well from San Diego to Oregon, though probably with great variations as to its sugar percentage, as will be seen from Mr. Dwinelle's report on the experimental cultures. Several varieties of sorghum were grown on the University grounds during the past season. Of these, the "Amber Cane" showed the most promising growth, furnishing in the shortest time the largest amount of forage. Its sugar-making qualities were tested during the first week of October, with the following result:

JUICE OF THE "AMBER CANE" (SORGHUM).

Specific gravity -----	1.0605
Solid contents corresponding -----	14.8 per cent.
Per cent. of cane sugar -----	10.1 per cent.
Purity co-efficient -----	68.2 per cent.

This is a considerably better showing for sugar-making purposes than the average shown by the experiments made at the Massachusetts Agricultural College, where there was about half-and-half grape and cane sugar, rendering the manufacture of the latter practically impossible. It appears from late reports, that in the Western States, similarly more favorable results have been obtained, and that sugar from sorghum has, during the past season, been made on a considerable scale. Doubtless the climate and soil has a great influence on the absolute and relative amounts of the several kinds of sugar, and actual experiment can alone determine whether or not, in any par-

ticular region, the quality of the juice can be made such as to render sugar-making profitable. The fact that the Amber cane juice was of such good quality even in the bay climate, would seem to render it probable that in the warmer climates of the interior much better results could be obtained. In any case, what with the possibilities of sugar beets, sugar cane, and sorghum, there can be little doubt that before long California will become an exporter instead of an importer of this indispensable product.

ANALYSES OF ORANGES.

At the request of the South California Horticultural Society, through its Secretary, Mr. L. M. Holt, the following analyses of oranges were made for the purpose of obtaining data for comparison with the fruit of other countries. One specimen, a "Mediterranean Sweet," grown by Mr. J. M. Asher, of San Diego, was somewhat under size, but with a very fine, smooth skin and high flavor. The other was a large and fine looking fruit, somewhat rough-skinned, but in flavor and sweetness very nearly the equal of the other, a seedling grown by Anson Van Leuven, of Old San Bernardino. In the statement given below, the third column shows the data of the analysis of a Florida orange, variety not stated, made by Doctor J. R. Nichols, of Boston, and published in the Jacksonville (Fla.) Sun and Press; also in the Southern California Horticulturist for April, 1879.

	Mediterranean Sweet.	Van Leuven Seedling.	Florida Orange.
Total weights of fruit -----	149.7 *grams.	233.5 grams.	246.5 grams.
Skin -----	10.487 per cent.	28.738 per cent.	23.33 per cent.
Seeds -----	.341 per cent.	.700 per cent.	2.84 per cent.
Pulp -----	89.172 per cent.	70.55 per cent.	73.83 per cent.
The skin contained :			
Water -----	43.723 per cent.	77.6169 per cent.	} 78.00 per cent.
Volatile Oil -----	5.753 per cent.	1.6775 per cent.	
Organic matter -----	49.505 per cent.	19.812 per cent.	21.36 per cent.
Ash -----	2.019 per cent.	.8936 per cent.	.64 per cent.
Seeds contained :			
Water -----	55.630 per cent.	53.09 per cent.	50.00 per cent.
Organic matter -----	42.941 per cent.	45.32 per cent.	48.64 per cent.
Ash -----	1.429 per cent.	1.59 per cent.	1.36 per cent.
Pulp contained :			
Water -----	86.446 per cent.	86.982 per cent.	90.99 per cent.
Organic matter -----	13.121 per cent.	12.572 per cent.	8.68 per cent.
Ash -----	.433 per cent.	.446 per cent.	.33 per cent.
Sugars :			
Saccharose -----	7.57 per cent.	7.33 per cent.	3.3 per cent.
Levulose -----	2.91 per cent.	2.9 per cent.	3.3 per cent.
Total sugars -----	10.48	10.24	
Acid :			
Citric acid -----	1.43 per cent.	1.284 per cent.	1.00 per cent.

* About 30 grams equal one ounce avoirdupois.

The most striking point in the above comparisons is the fact that while in the California oranges the total amount of sugars is over 10 per cent., in the Florida orange it is only about 6½ per cent. This, of course, cannot be taken as a general truth until corroborated by still farther examinations of definitely named varieties of Florida oranges. Moreover, the statement made by Dr. Nichols, that *grape*

sugar accompanies the cane sugar in the orange, must on the whole be deemed improbable unless confirmed by direct tests. The optical tests in the California oranges indicated altogether the presence of fruit sugar or levulose, instead of grape sugar.

The acid-percentage seems to be smaller in the Florida orange in the same proportion as the sugar.

As between the two kinds of California oranges, the most striking differences are in the proportion between the skin and pulp—a matter of the most vital interest to the consumer. The thin-skinned orange has nearly 19 per cent. more of pulp than the thick-skinned variety, the difference being due mainly to a large amount of water in the skin of the latter, which is, at the same time, much poorer in volatile oil. In the quality of the pulp, however, there is little difference, so far as analysis can determine this point.

ACID TESTS OF LEMONS.

In March, of the present year, a request was received from the South California Horticultural Society for the communication of some method by which the acid strength of lemons and oranges could be determined, without too much of the chemists appliances, by the committee on the subject, appointed on the occasion of the "Citrus Family Fair," held at Riverside, at that time.

In response to this request a quantity of a carefully "standardized" solution of caustic potash was forwarded to the Society, with directions for use; and the tests were carried out successfully by the committee, consisting of Dr. O. H. Congar, of Pasadena, and Mr. C. F. Heinzemann, druggist and chemist, of Los Angeles. The results obtained by them, originally published in the South California Horticulturist, for April, 1879, are here communicated in a tabular form. It is to be regretted that the weights of the respective samples of lemons are not given, but this omission will doubtless be made good in the tests to be made the coming season.

The calculations are made on the assumption that all the acid of the lemon is citric acid, which, of course, is not rigorously true, as some malic acid is probably always present. Since, however, for most of the uses of the lemon there is no difference in the value of the two acids, the tests are strictly correct for comparison:

No.	NAME.	Amount of juice.	Per cent. of citric acid.	Amount of citric acid in lemon.
1..	Shorb's seedling, budded on orange stock ---	9 drams.	6.4	.58 drams.
3..	Lisbon lemon on lemon stock	10 drams.	7.0	.7 drams.
7..	Lisbon lemon on lemon stock (very large) --	12 drams.	9.8	1.18 drams.
8..	Lisbon lemon on China lemon stock	10 drams.	7.13	.713 drams.
9..	Eureka lemon from original tree	8.5 drams.	7.3	.62 drams.
11..	Seedling lemon, the "Olivia"	5 drams.	8.8	.44 drams.
15..	Eureka lemon on orange stock	3 drams.	9.6	.29 drams.
17..	Australian lemon on orange stock	5 drams.	7.8	.39 drams.
20..	Seedling, the "Riverside Knobby"	6.5 drams.	10.0	.65 drams.
23..	Thornless sweet rind on orange stock	3 drams.	6.0	.18 drams.
35..	Eureka orange on orange stock	7 drams.	7.13	.5 drams.
36..	Lisbon lemon on orange stock	9 drams.	7.5	.68 drams.

JAPANESE PERSIMMONS.

Japanese persimmons; sent by Rev. Henry Loomis, December 10th, 1877.

The fruit was quite soft to the touch (evidently over-ripe), somewhat spotted with black, and had been covered with a film of wax, for preservation. The quantity of material being too small for satisfactory analytical determinations only the following were made, reserving a fuller examination for the succeeding (present) season.

Total weight.....	210.2 grammes, or 7 ounces.
Pulp.....	88.32 per cent.
Seeds.....	1.03 per cent.
Skins.....	10.65 per cent.
Water in the pulp.....	82.58 per cent.

Dried fruit contained:

Fibrin.....	20.64 per cent.
Gum.....	1.579 per cent.
Total ash.....	2.023 per cent.
Soluble ash.....	1.803 per cent.

VI. VITICULTURE.

CALIFORNIA WINES.

It is a matter of congratulation that the wine industry, so much depressed for several years from a variety of causes, has experienced a revival of prosperity from which there is every reason to believe there will be no falling back, unless it be by the most grievous fault of the wine producers themselves. As the depression was, beyond doubt, attributable chiefly to the hasty putting upon the market of immature and indifferently made wines, so the return of prosperity has been, in a great measure, the result of steady improvement in the quality of the wines marketed—such improvement being partly due to the introduction of grape varieties better adapted than the Mission grape, to the production of wines suited to the taste of wine-drinking nations; partly to a real improvement in the methods of treatment, and their better adaptation to the peculiarities of California-grown grapes. Doubtless much remains to be done yet, especially in the latter respect, before the best possible results are produced; for heretofore the vintners of each of the five wine-growing nations represented in California have followed their native habits and methods of treatment—the outgrowth of the experience of each country under its peculiar circumstances of climate, soil, temperature, etc. It is rather to be wondered that so much good wine has, even thus, been produced in California as to overcome the prejudice engendered by the first crude products marketed, and on account of which most of the California wines have heretofore been sold under foreign labels.

Owing in part to the depression of the wine interest, native wines have for several years past formed no prominent part of the exhibits at the several Fairs in the State. At the twelfth exhibition of the

Mechanics' Institute of San Francisco, in 1877, no wine was exhibited. In the following year (1878), at the suggestion of Rev. Dr. J. I. Bleasdale, of Australia, an invitation was issued by the managers to wine producers, to send samples of their best products for adjudication by a committee of experts appointed for the purpose. This committee consisted of the following gentlemen: Dr. J. I. Bleasdale, of Melbourne, Australia; Drs. H. H. Behr, Charles Bertody, and William Hammond; Messrs. B. B. Redding and Adolph Herbst, of San Francisco, and myself. The diversity of national and individual tastes thus represented seemed to insure an impartial consideration of the intrinsic merits of the native wines. It was agreed from the outset, that the unmistakable peculiarity of all California-grown wines (what is often called their "earthy" taste) should be taken for granted, and their quality determined not with reference to any particular standard of foreign wines but upon their own merits, as much as the preformed tastes of the judges would allow.

Forty-three samples of wines from various parts of the State were sent in, and not only tasted, but also subjected to distillation and various other tests by Dr. Bleasdale, whose painstaking investigation of Australian wines, in an official capacity, had specially qualified him for this examination. Five sittings were held by the committee, and the results published in tabular form in the official report of the thirteenth exhibition of the Mechanics' Institute, in conjunction with a highly valuable treatise on the whole subject of wine-making, by Dr. Bleasdale. In this he considers especially the treatment of wines in Portugal, as the climate most nearly alike to that of California, and calls attention to a number of points of importance heretofore, in a great measure, overlooked by California wine-makers.

In classifying the various wines, it was agreed by the committee that the labels of all bottles should be effectively covered until after the vote was recorded. That the highest number of marks allotted to any wine should be 20; that all wines falling between 17 and 20, on averaging the marks of the several members, should be classed as No. 1; all those similarly falling between 14 and 16, inclusive, should be classed as No. 2; and those between 10 and 13, inclusive, as No. 3. Those falling, in the judgment of the committee, below 10, should be excluded from consideration. The points recorded separately by each member were the following:

1. Date of vintage.
2. Color of the sample.
3. Condition.
4. Flavor.
5. Bouquet, both as to quantity and quality.
6. Body—light, medium, or full.
7. Acidity felt by the palate.
8. Value of the sample in numbers.

The absolute acidity of the samples, and the proportion of tannin contained, were also simultaneously demonstrated by chemical tests. The general results were as follows: Of the forty-three samples examined, thirty-two were placed in the first class; one only, however, receiving the maximum of 20 marks, almost unanimously; eleven were placed in the second class; on the average of marks, none in the third class; unanimously, none in the fourth class.

It should be added that the favorable results were a surprise to

most of the members of the jury, who had, it appears, not generally come in contact with native wines of this quality, and hardly believed in their existence. This circumstance adds to the value of their decision.

The following points were noted by the committee, although they were not made a matter of official record :

The wines were in nearly all cases rather heavier—richer in alcohol—than is usual in the wines in daily use in wine-drinking countries. This is more especially true of the wines made from Mission grapes, which at the same time are deficient in the “bouquet,” and only acquire it to some extent by age. The red Mission wines are, on the whole, decidedly superior to the white; a circumstance easily accounted for from the fact that the Mission grape is remarkably poor in acid, which is necessary to the development of the bouquet, and of the higher qualities of wine generally.

I have heretofore suggested that this peculiarity might, in a measure, be modified by not allowing the grape to become as “dead ripe” as is now usually done. This would tend to increase the acid at the expense of the sugar, which is in excess at best, thus producing the excessive headiness for which Californian wines are thus far noted. The vintners object to this course on the ground of the European precedent, according to which every additional day of sun is accounted so much gain to the quality of the wine. But what is true in the cloudy climate of Europe is not, therefore, necessarily true in sunny California. To suit the taste of the wine-drinking nations, we must aim to produce not the fiery but relatively flavorless wines of southern Spain and Italy, but something more like the universally accepted wines of middle and northern France; and this cannot be done under the glowing sun and cloudless sky of the interior of California, unless the nature and treatment of the grapes and wine are correspondingly modified.

A correct appreciation of this necessity has led to the introduction on a large scale of the tart, acid, and highly colored Austro-Hungarian “Zinfandel” grape—the opposite extreme as compared with the Mission. Even under the fervid sun of California, the pure product of this grape remains too harsh for most palates; but its mixture with the Mission (before fermentation, of course) produces an admirably blended product, in which the faults of both have become virtues; and among such blends were some of the finest red wines sampled and tested by the committee. Of course the combination of the acid and body-yielding Zinfandel with grapes of higher quality than the Mission may be made to produce still finer results. It remains to be seen whether in succeeding generations, under the influence of the Californian climate, the foreign grape varieties will not themselves gradually become modified in the same direction as the Mission grape. At all events, the committee were satisfied that one of the most important points to be more fully studied by California wine-makers, is the proper blending of the several grape varieties in the must as well as, subsequently, in the cask. The objections sometimes made to this process are, of course, a pure matter of sentiment, and as such are scarcely ever taken into account by intelligent wine-makers; who are well aware that even the best grape will rarely produce a palatable wine unless intelligently treated, and that, with few exceptions, the best wines in the world are judiciously

made blends, whether of different grape varieties, or of the product of vineyards differing in the peculiarities they impart to the product.

It follows from the above considerations that wine-making, like any other technical process of manufacture, requires special training, and, in a measure, a natural ability as regards taste, to produce the best possible results from under given circumstances. Hence the establishment of large wineries, conducted by persons specially qualified, would tend to improve the quality of wines, as against the practice of establishing a costly plant for each small vineyard, whose proprietor is not versed in the difficult art of wine-making.

Again, it has been the practice to put on the market, under the names of port, sherry, etc., wines whose only resemblance to their prototypes consists in a superficial resemblance of color, sweetness, and alcoholic strength, but lacking both the body and flavor of the originals. It should be distinctly understood that the production of these wines is dependent both upon the peculiarities of the countries and localities where their prime materials grow, and upon definite processes of manufacture, without which their character cannot be reproduced. Especially as regards port, the defects of the Californian practice are very clearly set forth in the treatise of Dr. Bleasdale, mentioned above. There is especially one point of radical importance, namely, the thorough aëration of the must by the treading process, which evidently exerts a decisive influence upon the product. The aëration can, of course, be effected otherwise than by treading, but without it neither port nor sherry is likely to be produced anywhere, and the labeling of weak imitations with their names can but depress the public estimate of California wines.

The same point, namely, aëration, will probably need attention in connection with other, especially white wines, whose keeping qualities appear to be frequently injured by "overfining," practiced evidently for the purpose of improving an unsatisfactory condition (as to clearness or "brightness"). The removal of the tannin, resulting from this process, is a most serious detriment to the keeping qualities of the wine, as well as to its palatableness.

It was also noticed that the use of inferior corks had, in a number of cases, injured the flavor of otherwise excellent wines.

Finally, it was a matter of remark that but few of the wines examined were of sufficient age to have developed their best qualities, and that in not a few cases the promise of the sample, under proper treatment, considering its juvenile age, would have placed it much higher than its present condition would warrant.

CALIFORNIA BRANDIES.

After the conclusion of its labors on wines, the committee held several sessions for a comparison of samples of grape brandies, most of which were furnished by General H. M. Naglee, of San José, while others were procured in the general market.

While in the northern part of the State, brandy is distilled chiefly from pressed pommace, that of Southern California is mostly made from unpressed pommace, or crushed grapes from which the "first run" only has been taken for the manufacture of wine. In a few cases, brandy has been made from the whole grape; and, other things being equal, the latter mode of course produces a product much superior to that made from pommace only; especially as regards the

much smaller proportion of the fusel oils, to which the deleterious effect of brandies upon the brain is mainly due.

General Naglee, after a study of the processes of brandy manufacture in the various districts of France noted for their product, concluded that it was possible to manufacture in California, better brandies than those of Cognac; the increased value of wines having almost entirely done away with their distillation for brandy in France. He has, therefore, for nine years past, distilled brandies from young wines made from various kinds of choice grapes, such as Burgundy, Folle Blanche, Riesling, etc., using therefor a still specially devised, by means of which he frees the distillates from the fusel oil to any degree desired, and thus produces a liquor as nearly free as possible from all but the finer flavors, and therefore better adapted to *bona fide* medicinal use than any other spirits now obtainable in commerce, and capable of replacing advantageously the too frequent use of opiates in ordinary cases. The price of such products must of necessity always be too high to place it within the reach of many of those who make a daily beverage of strong liquor; and yet, such spirits would be less injurious than those now in ordinary use, at least to the same extent that corn whisky is less fatal in its action on the brain and nerves than "absinthe." A comparison of such pure brandies with those now usually obtainable under the name "Cognac," will generally result in the rejection of the latter by any cultivated palate. It is to be hoped that the example set by General Naglee, in freeing the brandy as much as possible from the deleterious fusel oils, will be imitated by other manufacturers of brandies in the State, and thus establish for the Californian product the precedence over the much-doctored imported liquors.

THE PHYLLOXERA.

In response to the invitation of a committee of vine-growers of the Sonoma Valley, I visited that region in October, 1878, for a discussion of the phylloxera question in a public meeting called for the purpose, at the Town of Sonoma. I also availed myself of the opportunity to investigate the amount of damage done, and the progress made by the pest since my first visit, in 1875.

At that time, the insect had made its appearance only in a few localities; the center from which it spread appeared to be about four miles above the Town of Sonoma, where one vineyard was dying out very rapidly; while in the surrounding ones, and even at the distance of several miles to the southward, the beginnings of the attack were visible in the shape of low spots in the general level of luxuriant foliage, the outlines of which were manifestly spreading in all directions. The vine-growers, with a few exceptions, were unwilling to admit the existence of the insect, or that it menaced any serious danger. I could, therefore, learn little of its previous history, and had to rest satisfied with noting the facts as they then were. So far as I could see, these differed nowise from those observed elsewhere. Within the ever-widening circles of destruction, many vines were entirely dead, while others (and among these oftentimes those earliest attacked), maintained a feeble growth; the roots of those being mostly abandoned by the insects. The latter was found in the greatest abundance, not within the visible circle of damage, but from ten to

fifteen feet outside of its extreme margin. Here the outlying white rootlets were fairly clustered with the yellow brood, even at that late season (end of October), and showed all the marks characteristic of the true phylloxera. Microscopic examination left no possible doubt of the identity of the insect.

In the hope of drawing attention to the seriousness of the danger, a "bulletin" was shortly after issued by me from the University press, in which I gave a succinct account of the life history of the phylloxera (as then known), of the damage caused by it in Europe, its fearfully rapid progress, and of the efforts thus far made to check it. But little interest, however, was taken in the subject, even in the Sonoma Valley. Efforts made to secure legislative aid toward the suppression of the pest failed of success.

To my surprise, I could hear but little about the phylloxera for a year or two afterward; nor could I obtain any definite information regarding its progress by correspondence, my University duties preventing a personal visit at the time.

It appears that the cause of this silence was two-fold: First, the great depression of the wine interest, causing a feeling that the culture might as well be given up for something more profitable. Second, that although the spread of the insect had continued steadily, yet it was so much slower than has been the case in Europe, and than had been anticipated and predicted by me, that a great deal of incredulity and of wild speculation as to the cause of the dying-out of the vines had become current. It was not until the return of brighter prospects for vine-growing, owing to the diminished production in Europe and to a better appreciation of California wines in the market, that serious attention was at last given to the phylloxera, and the policy of "hushing up" was replaced by discussion as to the means of prevention and relief.

The situation a year ago may be summed up as follows: The ravages of the enemy have become manifest in a greater or less degree, from about six and a half miles above Sonoma Town to the lower end of the valley, a length of ten or eleven miles in all. Within these limits large tracts have been completely destroyed, the vines having been uprooted and grain sown instead for several years. It is difficult to ascertain the total area of vineyard that has disappeared, but it counts many hundreds of acres. On a still larger area, probably, the condition of the vines has become such as to render them unprofitable, so that they are being pulled up and used for firewood in the wineries. So far, no material difference in respect to the resistance of the several varieties have been reported, all those grown being of the type of the European vine (*vitis vinifera*), grown on its own or kindred stock. The Mission vine, naturalized for over a century in California, is at least as badly attacked as is the Riesling, Zinfandel, Rose of Peru, or any other grown.

Amid the general devastation, nevertheless, there are some exceptions—green islands, apparently of healthy vines in good bearing, yet surrounded on all sides by defunct vineyards. This is even the case in the vineyard which first succumbed, where, nevertheless, some of the original vines still remain, apparently in good condition. A close study of these exceptions could not fail to lead to highly valuable results; but to do so would require the whole time of a thoroughly qualified person for at least an entire season. In general, it appears that great care of the vines, good tillage, and manuring have been

practiced in all these cases; but there are many others in which no amount of care or manuring has seemed to possess any perceptible efficacy, and where the destruction has been as swift as in the doomed vineyards of France.

Whatever may be the true explanation of these remarkable exceptions, the general fact remains that in four years the insect has spread no more than about two and a half miles up the valley, from a point of great virulence, notwithstanding the fact that this is the prevalent direction of the summer winds.

The natural inference from this fact would seem to be that from some climatic cause, the phylloxera in California does not develop into the winged form, which evidently mediates its rapid progress in Europe; and that its progress is here altogether dependent upon the transportation or migration of the wingless forms.

It would be most important practically, as well as most interesting theoretically, to verify this inference by observation; but I have been unable as yet to obtain any observations on the subject, save as regards the general statement that no one has noticed about the infested vines any very small flies in July and August.

If it were definitely known that the winged form does not make its appearance, then it would follow that the pest can be stamped out by a concerted effort, by using those insecticides which, though locally effective, have failed to prevent the spread of the insect in Europe. Although too costly to be carried out by each one, such method could well be afforded by a community for the purpose of putting an end to the fearful evil, once for all. I mention in this connection the sulpho-carbonates, and the clay cubes impregnated with carbon bi-sulphide. It is true that a few dozen of the latter have been tried in a vineyard near Sonoma, with no perceptible effect; but this cannot be a matter of surprise, since the mistake was made of putting them around *alternate* vines, so that the one intended to be relieved would in any case be promptly restocked from its neighbors. The vines to be treated should, of course, have been entirely isolated, in order to render the experiment decisive.

I have desired, for several years past, to undertake a full investigation of the soils of the Sonoma Valley, in order to determine, if possible, whether their nature gives any clue to the exceptions recorded above. Unfortunately, it is only within a few months that I have been able to obtain the needful specimens, and their investigation must be deferred till next year.

The gravity of the danger is, however, getting to be appreciated in the Valley of Sonoma. Care is being taken not to take cuttings from infested vineyards; and in one case, at least, the grafting upon resistant stocks (the Taylor) is being resorted to in the formation of new vineyards. Mr. J. Dressel has, moreover, devised a most material improvement in the matter of grafting, which deters a good many from taking this measure for safety. Instead of grafting the rooted cuttings, he inserts one or two buds into the Taylor cutting before rooting it. This, of course, can be done very quickly, seated before a table, under shelter, and Mr. Dressel reports that very few of the eyes so inserted fail to grow. This practice, if generally adopted, would so simplify the whole process of rendering vineyards phylloxera-proof, that the neglect of this precaution in the vineyards of the future would hardly be excusable.

As to the presence of the phylloxera in other portions of the State,

extensive inquiries have failed to satisfy me that it exists outside of the Sonoma Valley, save at one point, in Fresno County, where it was introduced with cuttings of choice grape varieties from Europe. The proprietor, recognizing the fact in time, and conscious of the danger incurred by one of the foremost industries in the State, has used every effort to confine the pest within his own vineyard, at a considerable pecuniary sacrifice.

A critical examination of the vineyards of Napa Valley has satisfied Dr. Bleasdale that, as yet, that valley is free from the pest. Separated as it is from the infested portion of the Sonoma Valley by a chain of mountains and by the tules bordering the bay, its exemption can readily be explained on the supposition that the winged form of the phylloxera is not produced in the Sonoma Valley; and it may continue so long as railroad communication is not established between the two valleys. So soon as that occurs, the rapid communication and the shipments of vineyard produce from one to the other can hardly fail to convey the eggs or living insects, the enforcement of quarantine becoming practically impossible.

The dying-out of vines has, of course, been reported from other parts of the State, but has, in most cases that have come to my knowledge, been traced to other causes. The *oidium* is of very general occurrence and when neglected (as it has often been during the period of depression) it has of course materially injured the vitality of the vines, beyond the chance of ready recuperation. Ordinarily, when dealt with in time by the use of sulphur bellows or dredge, it is thus easily kept in check, and is but little dreaded in well-kept vineyards.

In some portions of the Sacramento Valley vineyards have been injured by a fungous parasite, causing spongy excrescences, or "black knot." I have suggested, as a remedy for this disease, the treatment of the knot with tar, or tar water, after cutting out its main mass. Whether this has been done, and with what result, I have been unable to learn.

It must be a subject of congratulation, that with the introduction of such a great number of grape varieties from foreign countries, a larger number of insect pests and diseases have not been introduced. On the whole it may be said that the vines of California are remarkable for their rapid growth, vigor, and thriftiness.

It is noteworthy, in this connection, that so far the varieties derived from the native American grape, which are almost exclusively relied on in the States east of the Rocky Mountains, are grown in California only as a matter of curiosity, or for table use at home. Their cultivation leaves open a wide field of future possibilities in varying and modifying the wine product of California, whose climate seems wonderfully adapted to the assimilation of the most varied cultures.

EXAMINATION OF THE "PERSIAN INSECT POWDER" AND "BUHACH."

The insecticide known for many years past as "Persian Insect Powder," and now vended under a great variety of names and with an equally great variation of quality, is now being manufactured on a considerable scale in this State, one of the several species of *Pyrethrum*, whose ground flower-heads constitute the powder, having been introduced from Dalmatia, several years ago, by Mr. G. N. Milco, of Stockton. The species cultivated by Mr. M. he states to be

the *Pyrethrum Cinerariæfolium*, and it seems that he has had to contend with many difficulties in finding the proper conditions for its successful growth on the large scale. These, however, he appears now to have completely overcome, and considering that California, exposed as she is to the importation of all the world's "bugs," has a special interest in cheap and efficacious insecticides, I have taken some pains in determining the conditions of the successful application of this promising agent, which has long been one of the indispensables of a traveler's outfit.

It has always been a matter of remark that a person could sleep without the slightest injury in a bed powdered over with "Persian Insect Powder," whose slight but penetrating odor would be death to the stoutest bed-bug and nimblest flea. Of late years the usefulness of the powder has been increased by the invention of small bellows, "insufflators," by which it is ejected from the nozzle in a dust cloud, which speedily disposes flies, mosquitos, etc., to leave the premises; one such, of great convenience, has been invented by Mr. Milco. Another mode of producing a similar effect is to roast the powder on a hot shovel, somewhat on the principle of the old-time "smudge," but with much greater effect on the insect and infinitely greater comfort to human kind.

It has, however, often been noted by those accustomed to the use of the "Persian Powder," that it would sometimes unaccountably fail to drive off the enemies of sleep; and this occurs more especially when bought in out-of-the-way places, where there is but little demand for it. To understand this, and to use the powder to the best advantage in each case, it must be kept in mind that: First, the active insecticide substance is a volatile oil or "essence," which can be extracted either by the usual method of steam distillation, or by extraction with solvents, such as ether, alcohol, or benzine. Second, this oil, under the influence of air, not only volatilizes, but is also subject to rapid oxidation, whereby it is converted into a greenish-black, inactive resin. It follows from these premises that: First, the powder cannot act to advantage where there is a rapid and frequent change of air. Second, it is of the greatest importance that the substance should be fresh, and kept tightly packed to exclude access of air as much as possible, for precisely the same reason that hops must be similarly treated.

The experiments made on this subject have had a two-fold object, viz.:

1. To determine the relative proportion and condition of the active essence in the several samples, while at the same time comparing their effects on living insects.

2. To ascertain the best mode of applying the insecticide in the open air to plants infested with insect pests.

By extraction with ether, both the active essential oil and the inactive resin formed by its exposure to the air are obtained in solution, and on evaporating the solvent at a low temperature the weight of the residue may be ascertained, and its nature observed. By this method the following results were obtained:

	Ether Extract.
"Persian Insect Powder," put up by Lazell & Company, New York -----	9.5 per cent.
G. N. Milco's "Buhach" or Universal Insect Exterminator—sample grown in 1878-----	6.1 per cent.
Same sample grown in 1879 -----	5.8 per cent.
"Lyon's Magnetic Powder"-----	4.9 per cent.

It thus appears that the imported "Persian Powder" was richer in extract than any of the other samples; it was a greenish-black, tarry substance, with intense odor of the powder.

The "buhach" or California-grown powder was less rich in total extract, owing perhaps, to its derivation from a different species of *Pyrethrum*. That extract, however, was a thin, greenish-yellow oil, of the same intense odor of the powder.

The extract from "Lyon's Magnetic" was a greenish-black, crumbly mass, of only slight odor—the color of this preparation is brown, instead of a clear, greenish-yellow; it is evidently prepared from the refuse and inferior portions, flower-stems, etc., of the plant.

It was attempted to drive off the volatile portions of the several extracts by steam, but the rapid oxidation thus occurring rendered the experiment worthless for comparison. The original preparations were, therefore, tested by direct application to an equal number of lively chinch-bugs, with the following result:

The insects treated with the "Persian" and with Milco's powders were overcome and died within so nearly the same time, that no material difference between the two could be established.

Those treated with "Lyon's Magnetic" continued unaffected for a long time, showing little distress at the time the other two powders had nearly finished their victims. One finally escaped from the bottle by flight, the other, doubtless of a more delicate constitution, finally succumbed in the course of four days.

These experiments show the importance of freshness in these insecticides. The imported "Persian" (in reality probably Dalmatian), although originally one-half richer in the active principle than Milco's powder, was yet so far deteriorated by time as to be placed on a level with it, so far as effectiveness was concerned. The importance of the home production of this article thus becomes obvious. Whether a different species of *Pyrethrum*, or a difference of soil and climate, is the cause of the difference in the percentage of the extract soluble in ether, remains to be determined by experiment.

As regards the use of the *Pyrethrum* as an insecticide in the open air, it is evident that the volatility and oxidability of its active essence must stand greatly in the way of its effectiveness; for a rapid change of air will as naturally interfere with its action, as it does with that of any other volatile poison thus administered to a human subject. It is obvious that in the form of powder it must speedily lose its efficacy under these circumstances.

Like all volatile oils, the essence of *Pyrethrum* is slightly soluble in water; and I think, from my experiments, that *the tea, or infusion, prepared from the flowers* (which need not be ground up for the purpose) is the most convenient and efficacious form of using this insecticide in the open air; provided that it is *used at times when the water will not evaporate too rapidly*, and that it is applied, not by pouring

over in a stream, or even in drops, but *in the form of spray from a syringe with fine holes in its rose*. In this case, the fluid will reach the insect despite of its water-shedding surfaces, hairs, etc., and stay long enough to kill. Thus applied, I have found it to be efficient even against the armored scale-bug of the orange and lemon, which falls off in the course of two or three days after the application, while the young brood is almost instantly destroyed. As the flower tea, unlike whale soap and other washes, leaves the leaves perfectly clean, and does not injure even the most tender growth, it is preferable on that score alone; and in the future it can hardly fail also to be the cheaper of the two. This is the more likely, as the tea made of the leaves and stems has similar, although considerably weaker, effects; and if the farmer or fruit grower were to grow the plants, he would save all the expense of harvesting and grinding the flower-heads, by simply using the header, curing the upper stems, leaves, and flower-heads all together, as he would hops, making the tea of this material by the hogshead, and distributing it from a cart through a syringe. It should be diligently kept in mind, that the least amount of *boiling* will seriously injure the strength of this tea; which should be *made* with briskly boiling water, but then simply covered over closely, so as to allow of as little evaporation as possible. The details of its most economical and effectual use on the large scale remains, of course, to be worked out by practice. But I have little doubt that its cultivation will prove an important acquisition to California, exposed as she is to the importation of the insect pests of the whole world.

Some observations reported to me seem to render it probable that the cultivation of the *Pyrethrum* between the rows of other plants will, in a great measure, protect these from the attacks of insects; as, of course, the plants themselves are let severely alone by them. It might even seem worth while to try this plan against the phylloxera, in so far as the winged insect could scarcely escape the deadly effects of the *Pyrethrum*, thus preventing its spread. It has been reported that a certain kind of sumac has thus served to save many of the vineyards of the Isle of Cyprus.

THE "LOCO WEED."

The vexed question of the "loco" has come before us repeatedly during the past seasons, but it seems impossible to come to any definite conclusions in regard to its causes and possible remedies, without elaborate and systematically continued experiments in the field in the region where the disease prevails. Specimens, as well as seeds, of the several suspected weeds have been received, and so far as chemical examination can determine, the question of their injuriousness will be investigated during the coming seasons. But chemistry cannot determine whether or not a hitherto unknown substance is a poison to cattle; the more as from all the testimony received, it is evident that certain external conditions materially influence the effects, if any, of the weed, and that it has been eaten, and its tea drunk, with impunity, by sheep kept at home. In one case specially investigated, a suit for damages was brought against the vendor of a certain lot of hay, from the use of which it was alleged that a number of valuable horses had become "locoed." This was believed in good faith by the purchaser, and a sample of the suspected weed was sent

to the department for investigation, by Messrs. E. H. Boyd and George Cummings, of Tehachapi.

This weed proved to be not one of those heretofore considered as the cause of "loco," but a lupin (what species could not be determined from the specimens), possessing the bitterish taste of most of its kind, but nowise to be suspected of poisonous qualities. No crystalline substance could be isolated from it, but this, of course, could not be considered proof of its being innocuous. The parties were advised to determine the question of poisonousness, by feeding some worthless animal on the plant, as the best and most direct test. But whether this was done, or with what result, I have not learned.

The subject is one of great financial importance to a large portion of the State, where stock-raising is rendered so precarious by the prevalence of "loco" that even the ordinary purposes of agriculture require the animals to be brought from a distance. As it is scarcely possible to come to any definite conclusions as to the means of prevention, without considerable expense and close observation by competent persons, it seems a proper subject for State aid.

MISCELLANEOUS SUBSTANCES.

Cocoanut oil cake, sent by Mr. R. J. Trumbull, of San Francisco, April, 1878, with request to ascertain its fitness for use as a manure.

It is a loose, coarsely fibrous mass, seemingly little else than woody fiber. It is successfully used for mixing with earth in pots, to keep it loose, but was now recommended as a manure. On heating it showed an oily smoke at first, but no indication of containing any notable amount of nitrogenous matter. The total amount of ash was 5.26 per cent., of which 1.89 was soluble, showing the following composition:

Chloride of potassium	50.648 per cent.
Sulphate of potassium	6.878 per cent.
Carbonate of potassium	12.953 per cent.
Carbonate of sodium	28.395 per cent.
	<hr/>
	98.874

The insoluble part consisted of:

Insoluble matter	3.367 per cent.
Ferric oxide and alumina	43.49 per cent.
Carbonate of lime	31.70 per cent.
Carbonate of magnesium	21.49 per cent.
	<hr/>
	100.05

The amounts of phosphoric acid in both portions of the ash was so small as to render its quantitative determination of no interest for practical purposes. It seems hardly possible that any considerable portion of the kernel of the cocoanut should be remaining in this material so poor in phosphates. Evidently it can be of use mainly as mechanical lightener of the soil, but not for supplying plant-food, other than a little potash.

Vitative compound, "seed plant invigorator"—Prepared by Wau-gaman & Company, Blairsville, Pennsylvania. Received May 9th, 1878.

It is asserted that "its use secures early maturity, sure crops, large yield, and destruction to insects,"—a coarse, whitish powder, consisting visibly of two materials, namely, irregular or needle-shaped

crystals, and irregular lumps of a yellowish tint. The latter are organic in their nature, and under the microscope appear to be either starch or flour, whose color has been affected by the other substances present. Examination showed it to consist of a mixture of:

Acetate of lead (lead sugar)	42.0
Sulphate of zinc (white vitriol)	58.5
Organic substance (flour)	9.5

As to the value of this compound for the purposes claimed, save alone that of "destruction to insects," and possibly fungous parasites, it would be difficult to imagine any mixture more utterly devoid of merit; the price for which it is sold being, moreover, about twenty times its commercial value. The solution of the mixture in water results in the formation of insoluble lead sulphate, and of soluble zinc acetate, neither of which have, within the memory of mankind, been supposed to be of the slightest consequence to plant life, save as poisons. So far as the compound can be supposed to act as an antidote to insect pests or smut, it would be advantageously replaced by the use of the well-known "blue-stoning" process. It is almost on a level with the "*Preservative compound from Canada*," recommended for the preservation of fruit, fresh, by simply smoking the latter in a barrel with the fumes of this "most wonderful invention of the age." This preparation, which was palmed off on purchasers by rapidly traveling "agents" throughout the State, was found to be simply a mixture of charcoal powder with a little sulphur. It would neither burn nor "fume" unless diligently nursed, and afterwards the fruit kept, probably, neither better nor worse. The tin cans of it, which were sold at \$1 apiece, would have been dearly paid for with five cents, coin.

VI. GARDEN OF ECONOMIC PLANTS.

The ground set apart for this purpose (see p. 7), embracing about $1\frac{1}{2}$ acres, is at this time subdivided into 688 plots, varying from 4 feet x 4 for medicinal plants, etc., to 25x30 for sorghums, etc.

Of these, 271 have been occupied by various experimental and illustrative cultures, as shown in the list given below:

Forage grasses, 24; grasses of various uses, 8; clovers, etc. (forage plants), 5; sugar cane and sorghum, 4; maize, 10; Egyptian corn, 2; broom-corn, 2; species and varieties of oil plants, 5; species and varieties of textile plants, 4; varieties of cereals, 12; millets, 4; rice, 4; root crops, species and varieties, 32; varieties of vegetables, 47; medicinal plants, 50; domestic and ornamental, 50; total, 271.

Besides these the following shrubs and trees, not heretofore represented on the University grounds, have been grown from seed:

Eastern oaks, 7; Japanese oaks, 1; European oaks, 2; California evergreens (conifers), 7; Eastern conifers, 4; European and Asiatic conifers, 8; hickories, 3; species of other useful trees, 20; ornamental and botanically important trees, 30; medicinal shrubs and trees, 15; Japanese trees bought, 6; total, 103.

These are now ready to be transferred from the seed-bed to the nursery, and, so far as desirable, will be distributed to various sections of the State for experimental culture during the coming season.

To this list will be added, during 1880, 34 species of seeds received from India (see p. 77); about 220 species and varieties of seeds ordered and received from Europe, including about 110 kinds of cereals.

About 40 additional varieties of cereals obtained in California, including 20 from the collection of Mr. William Brenner, lately purchased.

Fifty species received from miscellaneous sources.

About 100 additional kinds of economic seeds are, moreover, intended to be ordered from Europe this winter.

With these additions the number of species and varieties of plants of economic value, added within the two seasons, will be about 815.

THE CINCHONA TREE.

Among the most interesting of the experimental cultures of trees now on trial is that of the five kinds of cinchona, mentioned in the above list. Several hundred seedlings of these, from seed obtained through the courtesy of Sir William Robinson, ex-Vice-Governor of the Madras Presidency, are now growing in the propagating beds and green-houses on the University grounds.

The importance of the culture of this valuable tree hardly requires discussion. The high price of the important drug obtained from its bark is a heavy tax on a large—too large—portion of the people of the United States, and of malarious regions everywhere, the population being obliged to counteract the deleterious influences continually brought to bear on them by the preventive or repressive use of quinine. The high price of this substance has led to the use of a great number of substitutes, which, though more or less useful and energetic in their action, yet are rarely relied upon in critical cases, and are mostly the second choice of the patient and physician. However great the ills resulting from excessive or improper use of quinine, it is to-day more than ever considered an indispensable antidote for the incomparably greater afflictions which it relieves. But apart from this broader view of the question, the culture of the cinchona tree is an exceedingly profitable industry at the prices which its bark must bring for many years to come. Its introduction into the United States has therefore been often urged, but prior to the acquisition of California we possessed no territory likely to suit the climatic requirements of this tree—a native of the middle portion of the slope of the Andes of northern South America, a cool, equable temperature, with plenty of moisture, being the characteristics of its favorite haunts.

Under similar conditions the tree is now successfully grown on the higher portions of the Coast Range in the Indian Peninsula, which is not unlike that of the coast of middle and southern California, except that instead of summer rains the summer fogs would have to supply the needed moisture.

It is, of course, too soon to judge of the prospects of success from a single season's observations on seedlings. So much, however, is already evident that while the leaves are somewhat sensitive to *dry* heat especially, and might, therefore, occasionally suffer from the effects of "northers," they seem to thrive and grow well under the ordinary summer temperature of Berkeley, being slightly higher than that of San Francisco. This applies especially to the seeds, a part of which, sown with bottom heat of about 75° Fahrenheit, failed to germinate until removed from the warm-house. While no plants

have been left exposed to the severe frosts of the Christmas days just past, unprotected, it appears that those left in a covered cold frame outside have fared about as well as those within the protection of the warmed house. They have, therefore, undoubtedly endured, without injury, a temperature at, or a little below, the freezing point, yet the seedlings must be esteemed to be more tender than would be the growing sprouts of large trees.

It will, of course, be advisable to allow these trees to attain the age of at least a year, and possibly two, before attempting to transfer them to other parts of the State (chiefly south of the bay), where their adaptation to the climate can be definitely tested. A number of applications for trees have already been received from persons desirous of testing them; and since the question in this case is not that of the bearing of fruit, but simply of successful growth, a few years' experience will settle the main points. If the tree shall be found adapted to the climate, the question of the quality and quantity of the medicinal agents contained in the bark will remain to be determined. If, despite their reputation for adaptability, the kinds now represented should prove unsuited, it would still remain to test the species reputed to be the hardest of all, the *cinchona pitayensis*, whose seeds it seems difficult to obtain otherwise than by sending a special messenger to its native forests, at the proper time for gathering the seed.

THE JARRAH.

Of other trees now on trial as forest trees, one of the most promising is the genuine Australian "Jarrah" (*eucalyptus marginatus*), being the one most highly esteemed of all the "gum" trees, for the quality of its wood. About thirty vigorous seedlings of this tree are now growing on the grounds, and although not quite as rapid in growth as the common blue gum, seem to be quite as hardy and well adapted to the climate. Since forest planting is certain, before long, to become a prominent feature in California, the proper selection of the trees to be used is of no little importance. The resistance to drouth and marvelously rapid growth of the blue gum has given it universal acceptance for relieving the dreariness of treeless landscapes in the coast range, and for fire-wood, railroad ties, etc., it will doubtless remain a favorite. But the soft, spongy quality of its wood renders it ill-adapted to relieve the greatest want of California in the line of woods—something that will make a hoe-handle, or a wheel-spoke, or a plow beam. According to all accounts, the Jarrah may be looked to for wood adapted to such purposes, and if so, should be given the preference over the blue gum in general forest planting. It may still be hoped, however, that some of the hickories and oaks now on trial will also prove adapted to some regions of the coast.

DONATIONS OF SEEDS, PLANTS, BULBS, ETC., RECEIVED DURING THE YEARS 1878-9.

The following donations were made in response to a published request, asking for the transmission, to the Agricultural Department of the University, of all kinds of seeds, plants, or specimens of economic value, or likely to prove desirable for culture in any point of view; the object being to obtain on the University grounds as complete a representation as possible of such plants, for the purpose of study as well as experimental culture. Farther donations of this

character, including plants indigenous to California, are earnestly solicited, and will be thankfully received and acknowledged.

From Messrs. Tulio and Pedro Ospina, of Guatemala:

September, 1878—Seed of Guatemalan coffee; *Persea gratissima* (Aguacate pear); *Theobroma cacao* (chocolate tree); *Anona squamosa* (custard apple); *Achras sapota*, (*Sapodilla* plum).

From Mr. W. W. Brier, of Centreville California:

November, 1878—One quart of Sandwich Island (Kona) coffee (*Coffea Arabica*); 2 young coffee plants.

From Mr. E. J. Wickson, editor Rural Press, San Francisco:

Seed of *Reana luxurians* (*Tecosinte*); seed of *Panicum spectabile*, "Green Valley grass;" *Saya*, a kind of sago; pearl millet (*Penicellaria spicata*); white Russian wheat; Pringle's Defiance wheat; white Belgium oats; white Russian Giant, "rye" (*Triticum polonicum*); Cuzco corn.

From Mr. H. Kopsch, Chinese Imperial Commissioner of Maritime Customs—Chinese seeds:

September, 1878—Seed of buckwheat; 3 varieties of beans; 2 varieties of millet; 1 variety of ground-nut, peanut, (*Arachis hypogaea*); 2 varieties of wheat; 1 variety of barley; 1 plant of *Rhus vernicifera*.

From Oregon and California Railroad Land Office, per Mr. P. Schultze, Portland, Oregon:

Six choice varieties of wheat; 2 choice varieties of oats; 3 choice varieties of barley.

From Temescal Grange, by Mr. J. S. Collins, Secretary; sent by Department of Agriculture, Washington:

Thirty-seven varieties of vegetable seeds.

From Mr. J. B. Woolsey, Temescal:

March, 1879—Three kinds of tobacco seed.

From Mr. C. G. Hutchinson, San Gabriel, Los Angeles County:

Acorns and bark of cork oak (*Quercus suber*).

From Heidelberg Botanical Garden, Germany, through Professor E. Pfitzer, Director:

Fifty species of seeds of medicinal plants; 60 of miscellaneous plants.

From Mrs. R. C. Lewis, of Newcastle, Placer County, California:

October, 1878—Seed of 10 different species of native plants; 2 native lily bulbs.

From Mr. W. A. Sanders, Kingsburg, Fresno County:

February, 1879—One pound of pearl millet (*Penicellaria spicata*); 1 pound of Imphee sugar cane; 1 pound of Evergreen broom-corn; 1 pound of white Egyptian corn; 1 pound of brown Egyptian corn; 1 pound of amber sugar cane; 1 pound of golden millet; roots of prickly comfrey (*Symphytum asperinum*); roots of *Panicum spectabile*; tubers of Chufa (earth-almond).

From Mr. C. H. Dwinelle, Berkeley:

February, 1879—Seed of Carter's prolific barley; seed of Nepaul barley; Italian macaroni wheat (*Triticum polonicum*); Odessa wheat; water cove oats.

From Breeze & Loughrin, San Francisco :

Bald oats, from Washington Territory.

From General John Bidwell, Chico :

Pearl millet (*Penicillaria spicata*) ; white and brown Egyptian corn.

From Mr. C. D. Voy, through Mr. John Ellis, San Francisco :

February, 1879—Seed of five species of plants, from Navigator Islands.

From Sir William Robinson, ex-Lieutenant-Governor of the Madras Presidency—seeds from India :

March 27, 1879—*Cinchona officinalis*, 1 ounce; *Cinchona hybrid*, 1 ounce; *Cinchona succirubra*, 1 ounce; *Cinchona Calisaya*, 1 ounce; *Cinchona Condaminea*, 1 ounce (Peruvian bark trees); *Bombax Malabaricum*; *Acacia grandis*; *Albizia stipulata*; *Achras sapota* (*Sapodilla plumi*); *Berrya ammonilla* (*Trincomalee wood*); *Adenanthera pavonina* (bread tree); *Cochlospermum gossypium*; *Azedarachta indica* (*Pride of India, neem-tree*); *Callophyllum inophyllum* (oil tree); *Santalum album* (sandal wood); *Anona muricata* (sour-sop); *Cordia myxa* (medicinal tree, emollient); *Caryota urens* (one of the sago palms); *Psidium pyriferum* (pear-shaped guava); *Erythrina indica* (coral plant); *Erythrina indica* var. *alba*; *Zizyphus*, probably *vulgaris*, *jujube*; *Pengamia glabra* (poangay tree); *Guazuma tomentosa* (bastard cedar); *Cassia Roxburghii* *Tecton grandis* (teak tree); *Butea frondosa* (Indian Dhak); *Bauhinia variegata*; *Bauhinia purpurea*; *Ixora parviflora* (torch wood); *Trewoa nudiflora*; *Bignonia xylocarpa* (medicinal).

From Rev. H. Loomis, San Francisco :

March, 1879—Seeds of 3 varieties of Japanese mountain rice; seeds of *Rhus succedanea*; seeds of *Camphora officinarum*; 5 plants of same; 5 plants of *Rhus succedanea*, Japan vegetable wax-tree; seed of *Quercus cuspidata*.

From Agricultural Department, Washington :

April, 1879—Japanese seeds: *Quercus cuspidata*; *Quercus* species, *akakoshi*; *Retinospora obtusa*; *Retinospora* species; *Sciadopitys verticillata*, umbrella pine; *Cryptomeria japonica*; *Pinus densiflora*; *Abies firma*; *Acer* species, *Momijo*; *Hovenia dulcis*; *Chamaerops exelsa*; *Homoioelestis*; *Diospyros kaki*; *Firmiana platanifolia*; *Planera cuspidata*; *Illicium religiosum*.

From Mr. C. H. Dwinelle :

May, 1879—Seeds from New Zealand, viz.: *Panicum spectabile*, *Panicum hispidulum*, *Anthestina australis*, *Milium multiflorum*, forage grasses; *Pentzia virgata*; *Edwardsia grandiflora*; *Coprosma lucida*; *Melicope ternata*; *Podocarpus dactyloides*; *Podocarpus ferruginea*; *Piper exelsum*; *Electryon exelsum*; *Myrtus oboordatus*; *Mesodaphne jarairu*; *Pittosporum eugenoides*.

From Mr. A. Weber, San Francisco :

May, 1879—*Ipomæa limbata*; *Antigone lagopus*; 4 other kind of seeds from the Sierra Madre, Mexico.

From Mr. F. Keil, San Francisco :

May, 1879—Seed of *Piper cubeba*; seed of *Physostigma venenosum*, Calabar bean; seed of *Citrullus colocynthis*; seed of *Cocculus indicus*.

From Mr. F. Sutton, Fanning Island, South Pacific Ocean :

July, 1879—Seeds of *Pandanus utilis* (screw-pine).

From Mr. C. H. Dwinelle :

August, 1879—New Zealand seeds: *Festuca Billardierii*, *Paspalum dilatatum*, *Elymus condensatus*, *Elymus cristatus*, *Dactylis attica*, grasses; *Aristotelia racemosa*; *Cordylina australis*; *Rhizogonum* sp.

From H. Behr, M. D., San Francisco :

September, 1879—*Eucalyptus cornuta*; *Melaleuca trichostachya*; *Melaleuca parviflora*; *Lep-
tospermum laevigatum*; *Eremocarpus* species; *Arundinaria falcata*; *Cedrus Deodara*.

November, 1879—*Brabejum*, Proteaceous, nut-tree, South Africa; *Zizania aquatica*; *Hibiscus*,
from Port Darwin; *Kentia sapida*, New Zealand Palm; *Eucalyptus odorata*.

From Mr. Denison, Oakland :

September, 1879—Two *Echinocactus*, from Arizona.

October, 1879—Two *Cereus*, 1 *Echinocactus*, from Arizona.

From Mr. Leander Hawkins, University of California :

October, 1879—Bulbs and seeds of *Camassia esculenta*; mammoth specimens of potatoes, Wal-
lula, Oregon.

From Mr. B. B. Redding, San Francisco :

October, 1879—3 different kinds of eatable Indian bulbs, including camass.

From Mr. A. F. Pollock, Sophomore Class, University of California :

November, 1879—Seeds from Mazatlan, Mexico: Papaya; Cucumber sp. ("Pepinos"), Legu-
minous plant, Tabachin.

From Mr. E. J. Wickson :

November, 1879—Seeds of *Quillaya Saponaria*; Teosinte, *Reana luxurians*; *Bixa Orellana*,
Annatto.

From Land Department Oregon and California Railroad Company :

September, 1879—Six choice varieties of wheat; assortment of Oregon grasses.

From Mr. Claude V. Burke, Yolo, Yolo County :

September, 1879—Seventeen choice varieties of wheat; roots and seeds of *Panicum spectabile*.

From Mr. E. H. Frick, Washington Corners :

September, 1879—One bunch two-rowed, drouth-proof barley.

From Horace Davis & Company, San Francisco :

November, 1879—Wheat and barley from Mexico.

From J. Mailliard, San Rafael, Marin County :

November, 1879—Cuzco corn.

From Mr. C. S. Merrill, Cholame, Tulare County :

December, 1879—Plants of two species of loco weed (*Astragalus*); also seed of the same.

From C. H. Shinn, Niles, editor of California Horticulturist, through
Mr. J. Ellis :

December, 1879—Seeds of *Bambusa Braudisii*, *Arundinaria falcata*, *Bambusa stricta*.

CULTURE EXPERIMENTS.

Professor E. W. Hilgard:

SIR: I herewith submit a report on culture experiments on the grounds of the University of California, in the season of 1878-9, undertaken to determine the value of certain fertilizers, as applied to wheat and oats sown on our clay (adobe) ridge soil; also, notes on various cereals, forage plants, etc., cultivated to test their value and adaptability for introduction into general cultivation in this State.

Respectfully,

C. H. DWINELLE,
Lecturer on Practical Agriculture.

EXPERIMENTS WITH FERTILIZERS.

The ground devoted to these experiments with fertilizers presented, a few years since, several serious difficulties to be overcome before satisfactory results could be attained. Like most of the land in the neighborhood, it had been nearly exhausted by incessant cropping with cereals. From careless cultivation it was also in bad condition mechanically, there being many hard clods, such as are prone to form on clay lands in this climate of sudden changes from wet to dry, unless great care is used in turning the soil and pulverizing it thoroughly when it is in condition to crumble well. Certain weeds had got such a foothold as to frequently choke the crop that was struggling for an existence in the poor and hard soil. That fair progress has been made in subduing the land and the weeds may be fairly claimed from the record of this year's crops, as compared with those published for the years 1875-7. On the western series of plots, Tables I and II, there seems to be a visible effect from the deep plowing (12 inches) in the season of 1875-6. The central tiers of unmanured plots show to a decided advantage when compared with the corresponding ones in the eastern series, where the tilth has not been so deep. As a whole, the crops are much better than in former years.

The ground being uneven in its surface, there are little advantages and detriments which in many cases explain what, in the tables given, appear to be abnormal variations from the average yield. Without attempting to point out these peculiarities in all cases, the plots so affected have been avoided in making comparisons and drawing inferences as to the benefits derived from the fertilizers. In general, the manured plot has been compared with the average of several unmanured plots lying about it, and having no apparent disturbing influences acting upon them.

For the benefit of foreign readers, who exchange publications with us, and who may not be familiar with our climate, it is well to state that our agricultural year comprises the latter part of one calendar year and about three-fourths of the next one. This covers the periods of "the early and the latter rains" and the "dry season," the sprout-

ing of the seed, the full growth of the plant, and the harvesting of the mature crops. For this reason we speak of the season of 1878-9.

Our situation at Berkeley, two miles east of San Francisco Bay and opposite to the Golden Gate, gives us the coast climate, favorably modified by an elevation of from 200 to 300 feet above tide-water, on the foot-hills of the Coast Range Mountains. Our average rain-fall is about 22 inches, distributed mainly from November to May. Frosts are moderate, rarely heavy enough to crust the soil for a few hours, heliotropes and geraniums going untouched in favored spots, while cut to the ground in others. With a moderately warm spring and early summer, rarely 80° F., oftener 10° to 15° below that, much cool weather the latter part of July and during August, with sea breezes and more or less fog, we have a fair climate for oats, barley, and the hardier varieties of wheat, but a bad one for those subject to rust. September and October are usually the warmest months of the year with us, on account of the cessation of the trade winds from the ocean.

These explanations will assist many in other parts of the State in judging of the value of our results to them. Our difficulties are typical ones for a very large stretch of country for hundreds of miles up and down the coast of California; so that, in overcoming them, we feel that we are solving problems for a vast area of the most thickly populated portion of the State. In many cases our successes and failures give hints, amounting to almost positive assurance, as to what may be done in other parts of the State, where conditions are more, or less, favorable than here for the attainment of the object aimed at.

METHOD OF MAKING THE EXPERIMENTS.

In the experiments with fertilizers, under consideration, wheat and oats were sown upon our clay (adobe) ridge plots, in November, 1878, and reaped in July, 1879. About the middle of November, the ground having been wet by early rains, and then become dry enough to crumble as it left the mould-board, the plots were thoroughly plowed, as nearly as possible to a depth of 8 to 10 inches. The dressings of bone meal, lime, and plaster (gypsum), were then applied to their respective plots, and a second light plowing was given to all of the land, to further pulverize the soil and mix in the fertilizers. About a week later, on the 22d of November, seed was sown broadcast, at the rate of 100 pounds per acre, and harrowed in. The ammonia sulphate was not applied to the plots set apart for it until the 18th and 20th of March, 1879.

Harvesting began on the 7th of July, the oats being taken before the wheat, as they were riper. To insure accuracy, the cutting was done by hand with sickles, and the threshing on a canvas with flails. The grain was then cleaned in a fan mill, and the weight recorded in a book kept for the purpose, and also on a memorandum tied up with each sack. To verify the work done, the grain was again weighed, sack by sack, after having been several weeks in the granary. No material errors were discovered, although the particular lots had lost or gained from $\frac{1}{2}$ pound to 2 pounds, according to their quantity and position on the outside or inside of the pile. These changes were to be expected, from the facts pointed out in Mr. O'Neill's thesis on the variation of moisture in grain, published in this volume. The granary was a plastered room, with tight floor,

the windows being open for ventilation. The weights used are those taken at harvest time. The straw was also weighed as it came from the threshing floor.

In Tables I to IV the most important figures relating to the experiments with fertilizers are given in compact form. The eastern series, Tables III and IV, lie next to the orchard, and are numbered from south to north. The western series, Tables I and II, lie next the fence on the western boundary of the University grounds, and are numbered from south to north. The fertilized plots, and those alternating with them in the outside tiers, contain $\frac{1}{20}$ of an acre 4 rods by 2, while the central unmanured tiers, designated as $1\frac{1}{2}$, $2\frac{1}{2}$, etc., are but $\frac{1}{40}$ of an acre in area. For convenience in comparison, however, the products of these half plots have, in all cases, been multiplied by 2 in making up the tables, so that we have to deal uniformly with $\frac{1}{20}$ of an acre.

The fertilizers used are noted, with the amount applied to each plot, and also the rate and cost per acre. The cost of the fertilizers is reckoned on a basis of their net cost delivered here in quantities of 1 or more tons, and not the actual cost of such small quantities as were used.

The weight of the crop is given in pounds avoirdupois, and the corresponding rate per acre given in tons of 2,000 pounds for the straw, and bushels for the grain, 60 pounds of wheat, and 32 of oats being the legal standards in this State. In some cases, where the circumstances warrant a definite conclusion, the increased value of the fertilized crop is computed. The prices given to the produce are those now ruling in this neighborhood.

TABLE I.

Culture experiments with fertilizers on wheat and oats, 1878-9. Western series. Kind, amount, and cost per acre of fertilizer used. Weight and rate per acre of product. Increased value, if any, of crop per acre. Plots 2 rods by $4\frac{1}{2}$ of an acre.

		OATS.						WHEAT.	
Straw -- Grain --	OATS.	(Plot 1.) Unmanured. 123lbs.=1.23 T. per A. 72.5lbs.=43.31 bus. per A.	(Plot 2.) Unmanured. 120lbs.=1.20 T. per A. 64.5lbs.=40.30 bus. per A.	(Plot 3.) Unmanured. 171.5lbs.=1.71 T. per A. 77.5lbs.=43.44 bus. per A.	(Plot 4.) Bone meal 286.5lbs.=2.86 T. per A. 104.5lbs.=65.31 bus. per A. Increased value of crop, \$14.94 per A.	(Plot 5.) Low spot. Crop cut green on account of weeds.	(Plot 6.) 50lbs.=1,000lbs. @ \$7.27 per A. Lime. 218.5lbs.=2.18 T. per A. 87lbs.=34.37 bus. per A.	Straw -- Grain --	WHEAT.
		(Plot 1½.) 86lbs.=.86 T. per A. 65lbs.=40.62 bus. per A.	(Plot 2½.) 186lbs.=1.86 T. per A. 102lbs.=63.75 bus. per A.	(Plot 3½.) 120lbs.=1.20 T. per A. 60lbs.=37.50 bus. per A.	(Plot 4½.) 185lbs.=1.85 T. per A. 65.5lbs.=40.94 bus. per A.	(Plot 5½.) Low spot. Crop cut green on account of weeds.	(Plot 6½.) 177lbs.=1.77 T. per A. 80lbs.=50 bus. per A.		
Straw -- Grain --	OATS.	(Plot 1.) Unmanured. 123lbs.=1.23 T. per A. 72.5lbs.=43.31 bus. per A.	(Plot 2.) Unmanured. 120lbs.=1.20 T. per A. 64.5lbs.=40.30 bus. per A.	(Plot 3.) Unmanured. 171.5lbs.=1.71 T. per A. 77.5lbs.=43.44 bus. per A.	(Plot 4.) Bone meal 286.5lbs.=2.86 T. per A. 104.5lbs.=65.31 bus. per A. Increased value of crop, \$14.94 per A.	(Plot 5.) Low spot. Crop cut green on account of weeds.	(Plot 6.) 50lbs.=1,000lbs. @ \$7.27 per A. Lime. 218.5lbs.=2.18 T. per A. 87lbs.=34.37 bus. per A.	Straw -- Grain --	WHEAT.
		(Plot 1½.) 86lbs.=.86 T. per A. 65lbs.=40.62 bus. per A.	(Plot 2½.) 186lbs.=1.86 T. per A. 102lbs.=63.75 bus. per A.	(Plot 3½.) 120lbs.=1.20 T. per A. 60lbs.=37.50 bus. per A.	(Plot 4½.) 185lbs.=1.85 T. per A. 65.5lbs.=40.94 bus. per A.	(Plot 5½.) Low spot. Crop cut green on account of weeds.	(Plot 6½.) 177lbs.=1.77 T. per A. 80lbs.=50 bus. per A.		
Straw -- Grain --	WHEAT.	(Plot 1.) Unmanured. 125.5lbs.=1.25 T. per A. 56.5lbs.=18.83 bus. per A.	(Plot 2.) Ammonia sulphate. 207.5lbs.=2.07 T. per A. 68.5lb.=22.83 bus. per A.	(Plot 3.) Unmanured. 102.5lbs.=1.02 T. per A. 41.5lbs.=13.83 bus. per A.	(Plot 4.) Bone meal. 238.5lbs.=2.38 T. per A. 70.5lbs.=25.50 bus. per A. Increased value of crop, \$.28 per A.	(Plot 5.) Crop cut green.	(Plot 6.) 50lbs.=1,000lbs. @ \$7.27 per A. Lime. 235.5lbs.=2.35 T. per A. 74lbs.=24.67 bus. per A. Increased value of crop, \$.48 per A.	Straw -- Grain --	WHEAT.
		(Plot 1.) Unmanured. 125.5lbs.=1.25 T. per A. 56.5lbs.=18.83 bus. per A.	(Plot 2.) Ammonia sulphate. 207.5lbs.=2.07 T. per A. 68.5lb.=22.83 bus. per A.	(Plot 3.) Unmanured. 102.5lbs.=1.02 T. per A. 41.5lbs.=13.83 bus. per A.	(Plot 4.) Bone meal. 238.5lbs.=2.38 T. per A. 70.5lbs.=25.50 bus. per A. Increased value of crop, \$.28 per A.	(Plot 5.) Crop cut green.	(Plot 6.) 50lbs.=1,000lbs. @ \$7.27 per A. Lime. 235.5lbs.=2.35 T. per A. 74lbs.=24.67 bus. per A. Increased value of crop, \$.48 per A.		

TABLE II.

Culture experiments with fertilizers on wheat and oats, 1878-9. Western series. Kind, amount, and cost per acre of fertilizer used. Weight and rate per acre of product. Increased value, if any, of crop per acre. Plots 2 rods by 4=20 of an acre.

		OATS.								WHEAT.						
Straw -- Grain --	(Plot 7)	(Plot 8.)	(Plot 9.)	(Plot 10.)	(Plot 11.)	(Plot 12.)	Straw -- Grain --	U	N	M	A	N	U	R	E	D.
	Unmanured. 150lbs.=1.50 T. per A. 90lbs.=56.25 bus. per A.	30lbs.=600 lbs.@\$.75 per A. Bone meal. 195lbs.=1.95 T. per A. 91lbs.=58.75 bus. per A.	Unmanured. 120lbs.=1.20 T. per A. 76lbs.=47.50 bus. per A.	30lbs.=600 lbs.@\$.75 per A. Plaster-Gypsum. 168.5lbs.=1.68 T. per A. 100lbs.=62.50 bus. per A.	Unmanured. 193.5lbs.=1.93 T. per A. 94.5lbs.=59.06 bus. per A.	50lbs.=1,000 lbs.@\$.77 per A. Lime. 210.4lbs.=2.10 T. per A. 89.9lbs.=56.19 bus. per A.										
Straw -- Grain --	(Plot 7½)	(Plot 8½)	(Plot 9½)	(Plot 10½)	(Plot 11½)	(Plot 12½)	Straw -- Grain --	U	N	M	A	N	U	R	E	D.
	295lbs.=2.05 T. per A. 98lbs.=61.25 bus. per A.	148lbs.=1.48 T. per A. 88lbs.=55 bus. per A.	118lbs.=1.18 T. per A. 86lbs.=53.75 bus. per A.	114lbs.=1.14 T. per A. 82lbs.=51.25 bus. per A.	156lbs.=1.56 T. per A. 80lbs.=50 bus. per A.	221.1lbs.=2.21 T. per A. 94lbs.=58.75 bus. per A.										
Straw -- Grain --	(Plot 7½)	(Plot 8½)	(Plot 9½)	(Plot 10½)	(Plot 11½)	(Plot 12½)	Straw -- Grain --	U	N	M	A	N	U	R	E	D.
	165lbs.=1.65 T. per A. 62lbs.=20.67 bus. per A.	150lbs.=1.50 T. per A. 70lbs.=23.33 bus. per A.	Old thrashing floor. Very weedy.	122lbs.=1.22 T. per A. 66lbs.=22 bus. per A.	220lbs.=2.20 T. per A. 75lbs.=25 bus. per A.	316.8lbs.=3.16 T. per A. 92.4lbs.=30.8 bus. per A.										
Straw -- Grain --	(Plot 7.)	(Plot 8.)	(Plot 9.)	(Plot 10.)	(Plot 11.)	(Plot 12.)	Straw -- Grain --	U	N	M	A	N	U	R	E	D.
	131lbs.=1.31 T. per A. 52lbs.=17.33 bus. per A.	30lbs.=600 lbs.@\$.75 per A. Bone meal. 246.5lbs.=2.46 T. per A. 69.5lbs.=23.17 bus. per A.	Very weedy.	30lbs.=600 lbs.@\$.77 per A. Plaster-Gypsum. 140lbs.=1.40 T. per A. 51lbs.=17 bus. per A.	207lbs.=2.07 T. per A. 56lbs.=18.67 bus. per A.	50lbs.=1,000 lbs.@\$.77 per A. Lime. 263lbs.=2.63 T. per A. 74.25lbs.=24.75 bus. per A.										

TABLE III.

Culture experiments with fertilizers on wheat and oats, 1878-9. Eastern series (top of ridge). Kind, amount, and cost per acre of fertilizer used. Weight and rate per acre of product. Increased value, if any, of crop per acre. Plots 2 rods by 4=20 of an acre.

		WHEAT.					OATS.				
Straw -- Grain --		(Plot 1.)	(Plot 2.)	(Plot 3.)	(Plot 4.)	(Plot 5.)	(Plot 6.)	Straw -- Grain --			
		30lbs.=600lbs.@ \$9 75 per A. Bone meal. 212.5lbs.=212 T. per A. 67.5lbs.=22.5 bus. per A. Increased value of crop, \$11 76 per A.	Unmanured. 167lbs.=1.67 T. per A. 48lbs.=16 bus. per A.	10lbs.=200lbs.@ \$20 per A. Ammonia sulphate. 291.5lbs.=291 T. per A. 48.5lbs.=16.17 bus. per A.	Unmanured. 98.5lbs.=.98 T. per A. 32.5lbs.=10.83 bus. per A.	50lbs.=1,000lbs.@ \$7 27 per A. Lime. 124.5lbs.=1.24 T. per A. 51.5lbs.=17.17 bus. per A.	30lbs.=600lbs.@ \$7 27 per A. Plaster—Gypsum. 143lbs.=1.43 T. per A. 63lbs.=21 bus. per A.				
Straw -- Grain --	WHEAT.	(Plot 1½)	(Plot 2½)	(Plot 3½)	(Plot 4½)	(Plot 5½)	(Plot 6½)	Straw -- Grain --			
		138lbs.=1.38 T. per A. 34lbs.=11.33 bus. per A.	123lbs.=1.26 T. per A. 48lbs.=16 bus. per A.	114lbs.=1.14 T. per A. 37lbs.=12.33 bus. per A.	100lbs.=1.06 T. per A. 37lbs.=12.33 bus. per A.	158lbs.=1.58 T. per A. 59lbs.=19.07 bus. per A.	140lbs.=1.46 T. per A. 59lbs.=19.67 bus. per A.				
Straw -- Grain --	OATS.	(Plot 1.)	(Plot 2.)	(Plot 3.)	(Plot 4.)	(Plot 5.)	(Plot 6.)				
		30lbs.=660lbs.@ \$9 75 per A. Bone meal. 176.5lbs.=1.76 T. per A. 70lbs.=43.75 bus. per A. Injured by birds.	Unmanured. 150lbs.=1.50 T. per A. 61lbs.=38.12 bus. per A.	10lbs.=200lbs.@ \$20 per A. Ammonia sulphate. 241lbs.=2.41 T. per A. 108.5lbs.=67.81 bus. per A.	Unmanured. 163.5lbs.=1.63 T. per A. 87lbs.=54.37 bus. per A.	50lbs.=1,000lbs.@ \$7 27 per A. Lime. 174.5lbs.=1.74 T. per A. 89lbs.=55.02 bus. per A.	30lbs.=600lbs.@ \$7 27 per A. Plaster—Gypsum. 167.5lbs.=1.67 T. per A. 85.5lbs.=63.44 bus. per A.				

TABLE IV.

Culture experiments with wheat and oats, 1878-9. Eastern series continued.

		(Plot 7.)	(Plot 8.)		
		Unmanured. (Limed last year.)	Rejected on account of weeds.		
Straw	Grain	178.5lbs.=1.78 T. per A. 77.5lbs.=25.83 bus. per A.		WHEAT.	WHEAT.
		(Plot 7½.)	(Plot 8½.)		
			Rejected.		
Straw	Grain	187lbs.=1.87 T. per A. 56lbs.=18.67 bus. per A.			
		U N M A N	U R E D.		
		(Plot 7½.)	(Plot 8½.)		
Straw	Grain	196lbs.=1.96 T. per A. 57lbs.=35.62 bus. per A.	154lbs.=1.54 T. per A. 69lbs.=43.12 bus. per A.		
		OATS.	OATS.		
		(Plot 7.)	(Plot 8.)		
		Unmanured. (Limed last year.)	50lbs.=1,000 lbs. @ \$7 27 per A. Lime.		
Straw	Grain	266.5lbs.=2.66 T. per A. 96.5lbs.=60.31 bus. per A.	235lbs.=2.35 T. per A. 89lbs.=55.62 bus. per A.		

The analyses of soil from our experimental grounds, and a portion of the remarks in relation to the same, here given as published in the last report of this College, are interesting for comparison with the results of this season:

3. *Adobe ridge subsoil*, taken from the crest of the ridge on the Agricultural Grounds of the University, 400 feet west-southwest from the barn; depth, 10 to 20 inches.

Tint, a fawny yellow. Very heavy in working; difficult to till at all times; downwards it gradually passes into "rotten" clay-sandstone (fragments of which are everywhere intermixed with the soil), at a depth varying from 2½ to 5 feet. It is, therefore, ill-drained naturally, and holds water for a long time. Esteemed rather a poor soil.

MECHANICAL ANALYSIS.

Weight of stones over 1.2 mm.-----	13.233 per cent.
Weight of stones between 1.2 and 0.6 mm. -----	4.607 per cent.
Fine earth-----	82.160 per cent.

MECHANICAL ANALYSIS OF "FINE EARTH."

Clay-----	18.92 per cent.
Sediment of <0.25 mm.-----	17.25 per cent.
Sediment of 0.25 mm.-----	4.87 per cent.
Sediment of 0.50 mm.-----	6.79 per cent.
Sediment of 1.0 mm.-----	6.42 per cent.
Sediment of 2.0 mm.-----	6.64 per cent.
Sediment of 4.0 mm.-----	3.69 per cent.
Sediment of 8.0 mm.-----	7.45 per cent.
Sediment of 16.0 mm.-----	11.03 per cent.
Sediment of 32.0 mm.-----	9.49 per cent.
Sediment of 64.0 mm.-----	3.42 per cent.

CHEMICAL ANALYSIS.

Insoluble residue	86.002 per cent.
Potash .....	.189 per cent.
Soda .....	.154 per cent.
Lime .....	.484 per cent.
Magnesia .....	.452 per cent.
Br. Ox. Manganese .....	.038 per cent.
Ferric oxide	4.013 per cent.
Alumina	5.532 per cent.
Phosphoric acid .....	.057 per cent.
Sulphuric acid .....	.021 per cent.
Organic matter and water	4.051 per cent.

100.993

The unproductiveness of this soil is clearly owing to two causes combined: It is naturally poor in plant-food; and its mechanical composition makes it so refractory that it is only in exceptionally favorable seasons that what it does contain of plant food can remain available to plants, since, in drying, it becomes of stony hardness, with only cracks to aid the circulation and penetration of air and roots.

This is one of the cases in which improvement by merely supplying the plant food would be a waste of money, unless the physical condition be corrected at the same time. Under-drainage would probably do this most effectually; green manuring would also be a very important aid. But the unusually small amount of clay for so heavy a soil promises excellent results from the use of a moderate quantity of *quicklime*, or marl.

EFFECTS OF THE FERTILIZERS—BONE MEAL.

The appearance of the growing crops was noted at intervals from the 22d of January, 1879. At that date the plots dressed with bone meal, when compared with unmanured ones, were stronger in their growth, most of them decidedly so. This superiority was maintained throughout the season. The grain was so much taller as to be noticeable at a considerable distance. A glance at the figures of Plots 4, in Table I, shows a decidedly superior yield of both wheat and oats. Of oats the product is at the rate of 65.31 bushels of grain, and 2.86 tons of straw per acre, while the average of three adjacent unmanured plots, Nos. 3, 3½, and 4½, is 40.63 bushels of grain, and 1.59 tons of straw. The bone meal, therefore, appears to have increased the yield by 24.68 bushels of oats and 1.27 tons of straw. The oats are "fair feed," worth 1½ cents per pound, or \$9 86 for the 24.68 bushels, and the straw, at \$4 per ton, \$5 08 more, making a gain of \$14 94 per acre by an outlay of \$9 75. Deducting the outlay from the increased income, we have \$5 19 as interest and profit on an investment of \$9 75.

In like manner, we find that wheat Plot No. 4 gives 23.50 bushels of grain and 2.38 tons of straw per acre, a gain of 6 bushels of grain and 1.02 tons of straw over unmanured plots adjacent. With wheat at 2 cents per pound, and straw at \$4 per ton, this increase is worth \$8 28. Here is an apparent loss of \$1 47, if we have no gain in the crop on this plot next year. Plot 8, Table II, of oats in this series, does not show any marked superiority over the adjacent plots, although the yield of straw was probably helped by it. This apparent failure to produce any effect is explained by the fact that the soil of Plots 7 to 12 of oats is much better than the average of the series, and the yield on them was good all through.

Plot 8 of wheat shows a decided gain in straw, but little, if any, in grain, there being reasons why the low yield of unmanured Plot 7 cannot be included in a comparative estimate.

Turning now to the eastern series of plots, Tables III and IV, which lie 150 paces farther up the ridge, we find a notable effect produced by the bone meal on wheat Plot 1. The soil of this series is almost uniformly bad. A thin clay, very retentive of winter rain-water, and

needing under-draining. The average yield of wheat on nine unmanured plots was 15.20 bushels, and of straw 1.37 tons. Plot 7 is not included in this estimate, as it had the advantage of being limed last year. The bone meal plot gave 22.50 bushels of wheat, and 2.12 tons of straw, a gain of 7.30 bushels of grain, and .75 tons of straw, worth together \$11 76. A profit is here shown of \$2 on an investment of \$9 75, or over 20 per cent. per annum interest.

The corresponding Plot 1 of oats was unfortunately attacked by small birds, which came from neighboring shrubbery, and did much damage by pinching out the contents of the grain, while still in the milk. The yield was, therefore, disappointing when compared with the handsome appearance of the straw, which latter was decidedly superior to the average of unmanured oats in this series.

Thus far, the results of these experiments with bone meal are rather in favor of its use on the poorer portions of our soil. The experiments will be repeated to get more definite results. The fact that a first-rate article of bone meal can be had now in San Francisco, at \$30 per ton, should encourage liberal trials of it, particularly on pastures, where English experience has shown it most valuable.

LIME.

The limed plots showed a stronger appearance early in the season, then seemed to be gained upon by the unmanured plots; but the wheat, at least, had a decided superiority at harvest time. In the western series, Plots 6 and 12, the limed wheat showed a gain of about a foot in height. The yield too, was exceptionally good, being over 24 bushels of grain, and about 2½ tons of straw per acre. The fact of unmanured Plot 12½ giving 30.8 bushels of wheat and 3.16 tons of straw is explained by its situation on an incline, below limed Plot 12, from which it undoubtedly received much benefit by the heavy winter rains.

If Plot 6 is compared with Plots 6½ and 7½, having the same character of soil and no apparent disturbing influences, a gain is shown of 5.50 bushels of wheat and .72 tons of straw, worth together \$9 48, at an expense for lime of \$7 27, that is, a profit of \$2 21.

Wheat Plot 12 is not so situated that it can be fairly compared with adjacent plots, unless it be with Plot 11. It was decidedly better than the latter, standing thicker and taller, and having longer heads, and, as the figures show, giving a much larger yield.

In the eastern series, wheat Plot 5 does not show a good result, being on a very poor thin piece of land. Plot 7, which was limed last season, shows a decided superiority over unmanured Plots 6½ and 7½, and about 1 bushel over the two western limed plots, giving 25.83 bushels of grain. This is an important indication as to the lasting benefits which may be hoped for from the use of lime on these stiff soils.

The limed oats show a considerable gain in straw, but in grain are not remarkable, except for the close uniformity of their yield, which is good, as follows:

East Plot No. 5	55.62 bushels per acre.
East Plot No. 8	55.62 bushels per acre.
West Plot No. 6	54.37 bushels per acre.
West Plot No. 12	56.19 bushels per acre.

As these plots are scattered over a wide area, in which the yield of unmanured plots varied exceedingly, their uniformly good product is certainly a strong argument for the value of lime on such land. This is further strengthened by the yield of 60.31 bushels of oats and 2.66 tons of straw on east Plot 7, Table IV, which was limed last year.

With the light which we now have, we are inclined to think that lime is the most available dressing for the improvement of our stiff clay (adobe) soils. Although not acting directly as plant food, it renders fertile what would prove otherwise an inhospitable bed for vegetation, by acting upon it mechanically, and making it more friable. This fine division or good tilth of the soil gives access to the air and moisture, which hasten that disintegration of the constituents of the soil necessary to make them available as plant food. What is particularly important during our dry summers, the loose limed soil acts as a mulch to retain moisture, and does away with the cracking which is such a serious detriment in some cases.

Situated as we are at Berkeley, lime costs something over \$14 per ton delivered on the ground, after deducting the value of the barrels. The above estimates are made on a basis of 7.27 mills per pound. This might be considerably reduced, if large areas were to be limed, by buying by the car load in bulk. Many farms are so situated that they can buy at the kiln at \$6 or \$7 per ton, or, perhaps, burn for themselves at a less cost. It is to be noted that stone, which is not pure enough to make lime for masons' use, may do very well for the purpose in question. At kilns where first-class lime is sold there is usually a considerable amount of waste lime, mixed with wood ashes, which is not used and could be had at trifling cost. It is to be hoped that farmers throughout the State, who can get lime at reasonable rates, will give it a fair trial on their clay lands, not only on grain but also on their pastures which have been overstocked, and perhaps poached by the trampling of stock in wet weather. In the latter case it should encourage the growth of clovers, as well as loosen up the clay. Where clods have formed under careless cultivation, the benefit would probably be very apparent.

The kilns, from which the central portion of the State is mainly supplied with lime at present, are in El Dorado, Placer, and Santa Cruz Counties, a moderate quantity being also burned at Los Gatos, in Santa Clara County. There are, doubtless, many other localities where the necessary supplies of rock and fuel could be had to produce lime cheaply, and of sufficient purity for agricultural use. The farmer should bear in mind, however, that, while he is improving the tilth of his stiff soil by the application of lime, he must look mainly to other sources for that plant food necessary to keep up its strength under continuous crops, and avoid ultimate exhaustion.

PLASTER OR GYPSUM.

This fertilizer did not produce any marked difference in the appearance of the growing crops. At harvest, Plot 6 of the eastern series, Table III, gave 2.17 bushels per acre of wheat more than Plots 5, 5½, and 6½ about it. The oats on this plot showed no superiority, while those of Plot 10, Table II, in the western series were somewhat better. The inferiority of the wheat on Plot 10, is partly explained by injury from weeds on the side next to the old thrashing-floor. It

is pretty well established, by numerous experiments on both sides of the Atlantic, that gypsum is not of much value as an application to land for the cereals, however good it may be for clover and plants related to it.

Two instances have come to our knowledge of beneficial effects from the use of gypsum on the stiff soil at the Mission Dolores, in San Francisco. In both cases the soil was rendered much looser and more productive, and in one instance, where sifted over soil and plants in the spring months, it banished or destroyed the snails, which were doing much mischief. It is quite possible that lime would have accomplished both ends as well or better than the gypsum.

The value of gypsum on some of our so-called "alkali lands" has been pointed out in the last report of this College. Ground gypsum now sells in San Francisco at \$12 50 per ton in barrels. The rock to supply the mills there is brought from the Gulf of California. There are numerous deposits in this State which are of excellent quality, and mills will doubtless be erected near them as soon as the demand justifies the venture. It is desirable that some of our alfalfa growers should test this dressing on their fields.

AMMONIA SULPHATE.

The plots selected for the trial of ammonia sulphate showed no difference in appearance from the unmanured plots about them up to the middle of March. On the 18th of that month, 10 pounds of the ammonia sulphate was applied to the eastern Plots 3, Table III.

On the 30th the effect of the dressing was shown by a decided superiority in color and vigor of growth. At harvest, both the wheat and the oat plots showed a decided superiority in straw, nearly a ton more than the average of the unmanured plots about them. The wheat showed no appreciable gain in grain. The oats, on the other hand, gave 67.81 bushels per acre, the highest yield of oats on any of the plots, and 23.12 bushels better than the average of unmanured Plots 2½, 3½, 4½, and 4 lying adjacent to it. Ammonia sulphate was also applied to wheat Plot 2, Table I, of the western series, to the amount of seven pounds, on March 20th. The invigorating effect was very apparent in a superior yield of straw. There was also a gain of 1.68 bushels of grain over the average of the five adjacent unmanured plots. More experiments are needed to give clear indications of the general effect of this dressing. Very fine crops of oats have been raised in the neighborhood by the application of stable manure in liberal quantities. As ammonia sulphate is not at present available as a commercial fertilizer, on account of its high cost in the San Francisco market, we purpose to try various substitutes which will furnish ammonia at a lower rate. The ground dried meat, now sold in San Francisco at 1½ cents per pound, is promising in this respect. The waste from wool scouring and sorting should also be looked after.

GENERAL CONCLUSIONS.

In looking over our results one thing is quite evident—the day when it will pay cultivators of the soil in this State to turn their attention to commercial fertilizers is upon us. To know just what

to apply to each kind of soil, and for each crop, is an intricate question, which must be solved by careful study and experiment. The experience of others, in this and other countries, has established many useful rules that will help us. The analysis of soils and fertilizers will also be a most important aid, and save much useless expenditure in blind experimenting without a proper knowledge of existing conditions. Finally, actual field tests must decide what is best under certain conditions of soil and climate. Heretofore the richness of our soils and the high cost of fertilizers have been the main reasons why the profit to be derived from their use was not apparent. Now the cream has been taken off our new land, and at the same time prices generally, and that of labor in particular, have fallen, so that manufacturers can offer fertilizers at prices that were impossible a few years ago. Some of the figures mentioned could be materially lowered, if our farmers should use the fertilizers liberally. If a number should club together and make a contract for bone meal or superphosphates, for example, they could very justly get much better terms than if each one went by himself to buy what he needed. There is an unfortunate and wide-spread idea that because straw, and similar vegetable matter, does not readily decay during our dry season, therefore the land cannot be kept up by fertilizers. The plain inference seems to be, to get what you can from the land while the crops pay, and then move on. We do not believe that California is to be worn out in this way, and then abandoned. It may take time to convince men that nature has provided materials for keeping up their soil, if they will only devise ways and means for utilizing them. They should remember that an ounce of prevention is better than a pound of cure; in other words, it is far better economy to keep up a good soil, than to exhaust it, and then try to restore its strength.

EXPERIMENTS TO BE REPEATED.

To shed further light on the questions under consideration, and perhaps correct erroneous impressions, the experiments detailed above will be repeated, with some modifications, on another strip of soil. Lime, in particular, is to be used on a large scale. To test the staying qualities of those used the past season, the land then occupied has been sown with wheat and oats, which will be cut for hay. It may prove that the two seasons will show a profit from the dressings now in the doubtful list.

EXPERIMENTS WITH FORAGE PLANTS.

As the population of California increases, and land becomes high-priced, one of the most important problems to be solved is, "How shall a small piece of land be made to carry the same number of animals that could formerly be allowed to roam over many broad acres?" Considerable attention has, therefore, been given to forage plants in our experimental garden. The following is a report of results attained with some of the plants tried. A part of them are new to the State, and several others are tried in this county for the first time as sources of fodder.

SORGHUMS.

Under this head a large number of plants, having a great variety of popular as well as scientific names, may be grouped together. In the United States they are known as sorghums, or Chinese sugar canes; imphees, or African sugar canes; Egyptian, or Guinea corn; doura, dhurra, dhoura, or Tennessee rice; broom-corn, and the like. The conclusions of Professor Asa Gray as to their relations will commend themselves to those who cultivate and closely watch several of them at once. He makes the species *sorghum vulgare* cover a considerable number of forms that have been separated by other botanists, and designates the more marked ones as varieties. Thus, the so-called Egyptian corn, or dhoura, passes as *sorghum vulgare*, variety *cernuum*, and the syrup producing canes, commonly known as sorghums and imphees, come together as *sorghum vulgare*, variety *saccharatum*. The facts that in structure they vary mainly in the proportions of their parts, and that they cross-fertilize so readily that it requires great care to keep good forms pure, justify the assumption that they are the common descendants of one parent stock. Continuous selection of seed from plants excelling in the production of certain desirable things, as grain (Egyptian corn), sugar (imphee and sorghum), or long and fine seed-stalks (broom-corn), has evidently been the cause of the wide variation now to be seen.

1. MINNESOTA EARLY AMBER CANE (*Sorghum vulgare*, var. *saccharatum*).—Seed purchased in New York; also donated by W. A. Sanders, of Kingsbury, Fresno County.

The early amber cane was sown April 2d, in drills, 3 feet apart, and the plants were afterwards thinned out to stand at about 18 inches in the drill. Several showers fell within the six or seven weeks following sowing, after that the dry season fairly began, and the crop was not irrigated. The cultivation was that ordinarily given to Indian corn, simply keeping the ground loose and free of weeds. Like most of the sorghums, this one was at first apparently weak in its growth, but it formed good roots, and tilled so that there were from five to twenty canes to each plant. In the fore part of October, the canes had attained a height of from 4 to 9 feet, with the average nearer the latter than the former figure. The canes were thickest at a point a little above the first joint, where they had a diameter of from $\frac{1}{4}$ of an inch to nearly 1 inch. The blade of the leaf in this variety of sorghum is much narrower and more tapering than in most of its relatives. A full-sized leaf measured 2 inches at its widest part, by 2 feet 6 inches in length. No seed was matured.

On the 10th of November a portion of the crop, of fair average quality, was cut and weighed, giving a yield at the rate of 75,504 pounds to the acre, or 37 $\frac{1}{2}$ tons. This is certainly a large amount of forage for the labor required, though much less than could be obtained in warmer parts of the State, where water is available. Several of the best dairymen in this and other counties who visited the garden were deeply impressed with the value of this plant as fodder during the latter part of the dry season.

With us it seems to be at its best the first half of October, but in ordinary seasons it would make most excellent forage for at least two, if not three, months of the year, beginning to cut the latter part of September. Some cattle do not like it before the sugar is well developed, which is when the plant is in blossom. It is doubtful whether

it is good economy to feed it before that time, considering both the quantity and quality of the crop. Those having better soil and more sunshine than we can command would find the cane developing sugar earlier in the season than we do. This is the same sorghum that is looked upon so hopefully in the States of the Atlantic slope as a source of sugar on a large scale. It will be understood that the amber cane was grown by us as a forage plant, and not for sugar or syrup making. If the latter uses were in view more space would be desirable, and even for forage another foot between the drills might not come amiss, that is, place them at 4 feet apart.

Mr. Sanders recommends this plant, in the Pacific Rural Press, for pasturage, the seed to be sown at the rate of 5 to 8 pounds to the acre, in drills 15 inches apart, or thinly broadcast if the ground does not bake. Keep stock off until at least a foot high. He sowed a strip with it in a field of alfalfa (*medicago sativa*) and found that the cattle did not care for the latter plant while there was a bite to be had of the sorghum. It also bears extremes of wet and dryness better than the alfalfa. We cannot yet say what the comparative economy of the two would be taking into account the cost of seed, labor, etc. It is pretty safe to infer that the sugary sorghum would take the lead as a fat-producer. It will be interesting to see whether the roots live over winter and ratoon next year, and, if such is the case, whether the canes become rich in sugar earlier in the season than they do the first year from the seed.

Mr. A. T. Hatch, of Solano County, also reports, in the Rural Press, using it in November with excellent results in butter-making.

2. CHINESE SUGAR CANE (*Sorghum vulgare*, var. *saccharatum*).—Seed purchased of Sevin, Vincent & Company, San Francisco. Sown May 2d, in drills, 3 feet apart, and afterwards thinned to about 18 inches in the drill. This sorghum grew to a medium height and weight as compared with others. Its weight was not taken, as on November 10th it was past its prime as forage, and had been mutilated a good deal in gathering seed. It is apparently a valuable variety for this neighborhood on account of its quick growth. Although planted a month later than the amber cane, it blossomed a month earlier and matured a full crop of seed, which the other failed entirely to do. Neighboring trees may have favored it somewhat as a wind-break.

It will be tried again the coming year on the same ground with amber cane, and closely watched as a forage plant, and also as a source of grain suitable for fowls. One unusually heavy head that was saved is very promising in this latter respect.

3. SORGHUM (*Sorghum vulgare*, var. *saccharatum*).—Seed purchased of R. J. Trumbull & Company, San Francisco. Treated as the last. The crop was of fair quality and quantity, and moderately early. It will be tried again, and more closely watched.

4. LARGE CHINESE MILLET (*Sorghum vulgare*, var. *saccharatum*).—Seed received from Mr. H. Kopsch, China. Sown April 30th, in drills, as other sorghums, but not thinned out as much. This was a mistake as the plant is very leafy and strong, and needs more room. Four or even 5 feet between the drills, and 18 to 24 inches in the drills would be close enough.

At the time of cutting, November 10th, the plot was not as mature as those already mentioned. Late planting and crowding were, probably both in a measure, causes of this, but the variety seems to be really a late one, and might be valuable in planting for successive

cuttings. The height of the more mature canes was from 3 feet to 5 feet 6 inches. Leaves $2\frac{3}{4}$ inches wide, by 2 feet 6 inches long. Their vigorous appearance attracted the attention of the dairymen.

In the latter part of the season what appeared like a rust attacked the crop. On close examination, with a good pocket glass, this was seen to be, in reality, caused by mites on the under side of the leaves similar to the sugar mite. The insects were in all stages of development, and varied from nearly colorless to yellow, and even brick-red. They would be an interesting study to the entomologist under the microscope. It may be a serious question whether these insects would not be injurious to animals fed on the sorghum infested. The crop yielded at the rate of 52,408 pounds or over 26 tons per acre.

5. IMPHEE (*Sorghum vulgare*, var. *saccharatum*).—Seed donated by W. A. Sanders; sown April 3d, in drills, 3 feet apart, and plants thinned out to about 18 inches. It tillered well, and grew to a height of from 4 to 8 feet. At their largest the canes measured from $\frac{1}{4}$ to $\frac{7}{8}$ of an inch in diameter. The blade of a full-sized leaf measured $2\frac{3}{4}$ inches wide by 2 feet 6 inches long. November 10th a weighed portion of the crop showed the yield to be at the rate of 64,562 pounds, or $32\frac{1}{2}$ tons per acre, in this respect standing next to the amber cane.

6. EVERGREEN BROOM-CORN (*Sorghum vulgare*, var. —).—Seed donated by W. A. Sanders; sown in drills, as forage, April 3d. This may be classed among the sorghums giving a good quantity of forage at an earlier date than the amber cane. It is also hardy enough to mature seed with us. Others report favorably on its use as forage. For manufacturing brooms the brush raised in the interior sells better than that from the coast.

7. BLACK-SEEDED BROOM-CORN (*Sorghum vulgare*, var. —).—This plant was grown for the purpose of illustrating the source of broom material. Being thinned out to produce long brushes, the canes were coarse for fodder. If crowded, it might compare favorably with those given above. Its tall canes should make the yield heavy. A trial will be given it in this respect.

8. EGYPTIAN CORN, OR DOURA (*Sorghum vulgare*, var. *cernuum*). Seeds donated by Gen. John Bidwell and W. A. Sanders. Both the white and brown varieties were sown in the middle of March. The brown variety appears rather hardier as a grain plant, while the white may be more desirable as forage, on account of sending up more canes from the roots. The brown is inclined to branch from the upper joints and give late crops of small heads. A portion of the brown corn was examined, November 10th, as to its yield of forage, where grown in drills 3 feet apart, and at about 18 inches in the drill. The height attained was from 3 feet 6 inches to 5 feet 6 inches. The larger leaves measured $3\frac{3}{4}$ inches in width by 2 feet in length. The weight of the crop was at the rate of 24,891 pounds, or nearly $12\frac{1}{2}$ tons to the acre; far less than the other sorghums. Many of the lower leaves were dry, however, and the pithy character of the canes showed that they had passed their prime as fodder, and would, doubtless, have weighed much more if cut a month or six weeks earlier.

Egyptian corn has a recognized position in this neighborhood as furnishing excellent and abundant forage the latter part of summer. The yield of grain did not bear out the reputations of the plants in warmer parts of the State. The cool coast wind apparently blasted the flowers, as the heads on the sheltered sides of the plots were fairly filled. The same variation was noticed on a neighboring farm, where

the white variety was tried. The rows under the lee of trees bore much more corn than the rest. Both varieties give a succession of crops; that is, the heads on the larger stalks mature first, and are followed by smaller ones, borne on branches from the first stalks in the brown kind, and on ratoons or sucklers from the roots in the white. This makes it necessary to go through the field several times to gather the grain as it ripens, cutting off the heads with a sharp knife or pruning shears. It may be that a neglect to do this has been the cause of the general complaint this year of the depredations of the birds. The white is said to suffer the most in this respect. Experience may prove that the hand labor involved, and losses from birds, will make this grain really more expensive than some which yield less to the acre. If such is the case it is to be regretted, as the grain, particularly the white kind, is very desirable as food for poultry and other animals.

9. ANGOLA PANIC (*Panicum spectabile*).—Also known in parts of South America as Coapin de Angola, and in Australia as Phillips' grass. Roots were donated by W. A. Sanders; seeds were received in exchange from Dr. S. M. Curl, of Manuka Bush Station, New Zealand. The roots were cut up in joints and planted at about 15 inches apart. They soon sent up shoots and formed large bunches, which bid fair to fill the whole plot next year. The grass from the seed also did well although started late. It was not cut to test its yield as it was desirable to secure seed if possible. The height attained was from 3 to 4 feet. There were two plots set with roots, one being irrigated and the other not. Both did exceedingly well, although that irrigated was most vigorous.

This grass is a native of Angola, on the west coast of Africa. From there it has been carried to South America, Australia, New Zealand, and other countries. Wherever the climate is suitable it is highly prized. Dr. Schomburgk, Director of the Government Botanic Gardens at Adelaide, Australia, recommends its use for fire-breaks about wheat fields, in strips a rod or so wide. He says: "During the hottest time the plants have grown vigorously." Dr. Curl states that it will survive considerable frost, starting fresh from the roots, although cut down to the ground. Mr. Sanders advises seeding with 2 pounds per acre, in drills 15 inches apart, and adds: "It will form a solid mass of grass in three months. I am speaking of what it will do with only moisture enough to germinate." Mr. A. T. Hatch, of Solano County, commends it highly as a grass which farm animals are fond of, with the following caution: "It is not advisable for anyone to plant the Angola Panic where he does not want it to stay, because it will be as hard to kill as morning glory." It is doubtful whether it will mature seed with us. The germinating power of that which was gathered will soon be tested under glass. The tops have been cut to the ground by the frost.

Colonel Wm. Hollister, the veteran sheep-raiser, saw this plant in our garden, and expressed the opinion that it was destined to be of incalculable value to the graziers of this State. It is to be hoped that no serious obstacle to its general use will be found.

10. A KIND OF MILLET GRASS (*Milium multiflorum*).—Seeds received in exchange from Dr. S. M. Curl, New Zealand. As the supply of seed was small, and received late in spring, it was thought best to start it in pots. When fairly rooted, the plants were set out in the open garden. Water was given at the time of transplanting,

and that was the last received until the autumn rains. The grass grew to a height of 2 to 3 feet, and each plant formed a considerable bunch. Its deep, healthy green color, and delicate spreading panicles, made it admired by all who saw it. Drouth seems to have no effect upon it. It is to be noted, however, that each plant had plenty of space about it, and the soil was kept free of weeds. When it has filled the plot, it may need water as well as other grasses. The heavy frosts which we have had have touched the extremities of some of the leaves only, although they are full of sap. This fact gives promise of a valuable addition to our resources in winter pasturage. Its future development and feeding qualities will be noted with interest. Its finer leaf and stalk, and frost-resisting powers, may make it a powerful rival to the Angola Panic.

Dr. Curl reports the same hardness, as regards drouth and cold, in his experiments with *miliun multiflorum* in New Zealand, but does not state from what place he imported it.

11. PEARL MILLET (*Penicillaria spicata*).—Seed donated by W. A. Sanders and General John Bidwell. As wonderful results had been reported in growing this plant as forage in the Atlantic States, and in the irrigated districts of the San Joaquin Valley, we were determined to give it a fair trial. It was sown in drills as a forage plant, in land well dressed with stable manure, on the 31st of March, and had the benefit of several good showers, but no irrigation. The crop was very poor, in fact a failure, if compared with any of the sorghums or Indian corns. Another plot was sown about the middle of May, in broad drills, at the same time and in the same manner as some brown Egyptian corn. Though not weighed, it is safe to say that the corn gave four times the crop that the pearl millet did. Both received a light shower after sowing, and before the dry season set in. A third piece was grown with irrigations as frequent as seemed to be needed to keep it from suffering, according to the weather. The seed was put in on the 15th of March, in drills 18 inches apart, and the plants thinned out to about 1 foot in the drills. The plants tillered so as to cover the ground, but only a portion sent up stalks to a height of 4 to 5 feet. When cut, the latter part of October, the yield was at the rate of 33,188 pounds, or over 16½ tons per acre. It evidently is not a profitable crop with us. The amber cane gave more than twice the yield, with far less trouble. It will be tried again, with some variations in treatment. No seed was matured. From results reported by others, it is pretty clear that the pearl millet needs both heat and moisture to enable it to give the best possible results.

12. TEOSINTE (*Reana* or *Euchlæna luxurians*).—Seeds donated by E. J. Wickson, editor of the Pacific Rural Press. Being received rather late in the spring, plants were started in pots, and then set out in the open ground. The roots struck deep, and great bunches of strong looking shoots, as thick as a man's thumb, showed themselves, and promised a great yield, both with and without irrigation. The result was, however, very disappointing. None of the stalks attained a height of more than a foot or so, before the frost cut them to the ground.

It is possible that there may be a better growth next year from the old roots, if they live over, or from an early sowing of seed. We are not sanguine of success with this plant, as we have noticed accounts of similar results from coast regions of South America. It is said to be a native of the interior of that country. Those having warmer

summers than ours may report with Mr. Sanders, of Fresno County, that it is one of the most productive of the larger grasses.

CONCLUDING REMARKS.

The effect of winter on our new forage plants will be a very important item in estimating their ultimate value. Experiments will be made to determine the best time for cutting, to secure the largest yield for the season, and best quality of fodder.

With the sorghums, this is intimately connected with the development of sugar, and the time when this is greatest varies much in the different kinds. The differences in time of maturing, and in hardiness, show that successive cuttings may easily be had, and that the failure of one, in any given place, does not prove that another may not be found adapted to the locality.

It will be important to compare the yield of the sorghums with sweet Indian corn, which is coming into such favor as forage in the Atlantic States. It is quite probable that, where irrigation is not practiced, the sorghums will give green feed later in the season than the corn; in that case supplementing, rather than superceding it. It is to be regretted that we have no facilities for testing the feeding qualities of the plants grown, but possibly some way may be devised to supply this want.

A SERIES FOR SUMMER AND AUTUMN.

Those having a climate similar to ours, and wishing for green feed from early spring to late autumn, will not go far amiss in following the list given below, which has been made up partly from the results of our experiments in the garden, and partly from observation of the practices of farmers in the neighborhood:

1. CANARY GRASS (*Phalaris canariensis*).—The same that is used for birds. If sown early it will be 2 to 3 feet high in March or April.

2. NEPAUL OR BALD BARLEY (*Hordeum trifurcatum*).—It should be sown on the best land available, in several plots, from the first rains until the middle of February. Cattle are exceedingly fond of it.

2. BALD OR NAKED OATS (*Avena nuda*).—These make an immense amount of leafy fodder, if cut in bloom.

4. INDIAN CORN (*Zea mays*).—The smaller varieties from the north mature earlier than the southern kinds. Of field corns the small Canada and King Philip are good, and the Minnesota and Red River sweet corns will mature with wonderful rapidity. For late cutting, some of the so-called evergreen kinds should be added. Plant the first as soon as frosts are over, and plant two or three times at intervals of ten days or two weeks.

5. SORGHUMS (*Sorghum vulgare*).—If the following sorghums are sown about April 1st they will come in, one after another, during the latter part of summer and autumn: Chinese sugar cane (2), Egyptian corn (8), evergreen broom-corn (6), amber cane (1), imphee (5). The figures enclosed in parentheses refer to the experiments reported above.

EXPERIMENTS WITH CEREALS, ETC.

The results of trials of numerous grains and other plants, which are crowded out of this report, will be prepared for publication through some other channel at an early day.

To increase our knowledge of the value of foreign plants to our State, and multiply the chances for success in securing seeds and stocks for propagation, we have divided choice lots of seeds with careful cultivators in several counties, who have agreed to give them proper care and report results. We have also received, on application, some very valuable details of experience with certain plants and methods of culture from a number of gentlemen.

This method of investigation commends itself strongly as a means of adding rapidly to our store of practical information as to the resources of California. We cannot have too many facts of the kind indicated for use in the college lecture-room and in answering the many letters of inquiry which flow in upon us from all quarters.

Among those who have aided us, in this way we have to acknowledge our indebtedness to the following gentlemen: A. D. Colby, E. T. Crane, E. H. Frick, John Kelsey, C. H. Shinn, J. B. Woolsey, and Wm. Woolsey, of Alameda County; R. Ashburner, and R. G. Sneath, of San Mateo County; General John Bidwell, of Butte County; C. V. Burke, of Yolo County; W. B. West, of San Joaquin County; J. Rock, of Santa Clara County; W. A. Sanders, of Fresno County; C. G. Hutchinson, of Los Angeles County; A. Mailliard, of Marin County.

EXPERIMENT STATIONS.

A system of small experiment stations could easily be built up, which would do very valuable work at a small expense, by securing the coöperation of intelligent men in various parts of the State, who would undertake experiments under directions from this institution. In many cases the securing of new seeds would be accepted as compensation for the outlay involved. In others, as in trying fertilizers and the like, a simple guarantee against pecuniary loss would suffice. For the solution of more intricate problems a more formal arrangement would be necessary. In this way definite results could be obtained under a great variety of conditions as to soil and climate, and at a small outlay.

As this subject is prominently before the public these suggestions, drawn from our experience, can hardly be ill-timed.

C. H. DWINELLE.

CEREALS FOR THE UNIVERSITY.

The following call for contributions to our collection of grains, and the response elicited from Mr. E. H. Frick, were kindly published in the Pacific Rural Press. We have to acknowledge frequent favors of the kind from the proprietors of that valuable paper:

EDITORS PRESS: The grain growers of the coast can do a favor to the College of Agriculture, and, we believe, aid materially in securing information which will be valuable to themselves, by collecting samples of the cereals for us during this harvest season. We want specimens of every well defined variety of grain, say six to twelve good heads, with stems six or eight inches long, and one to three quarts of the pure grain. In case of a new or rare kind, a less amount would be acceptable.

With each sample should be sent as full notes as possible on the following points:

Origin and history.

Introduction; when and by whom made.

All the names that it has borne here and elsewhere, especially if it came from a foreign country.

Value as to yield, freedom from or liability to injury, diseases, or attacks of insects.

Adaptability to various soils.

Ease or difficulty of thrashing—damage from winds when growing or ripe.

Quality for milling, feeding, brewing, distilling, shipping, etc.

Value as forage, green, as hay, or as straw.

Strength or weakness of straw, and consequent liability to lodge.

Early or late maturity, and when best sown.

Habit as to tillering, and number of heads on a stool.

Quantity of seed best to sow for grain and for hay.

Any peculiarities of color at any stage of growth, and changes of color.

Finally, any other items in regard to culture, etc., which bear upon its value or will help in its identification. Such specimens will be of great value in illustrating lectures to the students in agriculture, and furnishing material for experiments on the University grounds. We can also use portions in exchanging for new varieties with foreign correspondents.

As a return to the donors, we hope in many cases to identify several so-called varieties as one and the same thing under different names. This will prevent needless confusion, and frequently financial loss.

Some of your readers may have had a similar experience to that of the western farmer, who went sixty miles from home and bought a choice new wheat at a high price, and found, when it ripened, that he had grown the same thing for years.

We will also be happy to send cereals or other seeds to those who wish to improve their varieties. This is a legitimate part of the work of the University as provided for in the organic Act.

Small packages may be sent by mail, and the postage will be refunded to the sender. We will send a printed label to any one applying, that will carry packages free through Wells, Fargo & Company's express.

All specimens and letters on the subject should be addressed to

C. H. DWINELLE,

University of California, Berkeley, Alameda County, California.

THE FRICK BARLEY.

EDITORS PRESS:—In response to the call for cereals for the University collection, kindly published in your paper, I received from Ernest H. Frick, Washington, Alameda County, two or three pounds of clean grain, and also a handsome sample in the straw, of a barley that was new to me. With it came the following letter, which explains the introduction of the grain, and is full of just such details of the mode of cultivation and results as we want, but which are too often omitted by parties sending samples to us.

I should have answered the letter more promptly if we had not been expecting a large collection of cereals from Europe, and I wished to compare the new barley with them. Mr. Frick writes as follows:

"I send you some barley that I found growing in my field of Chevalier barley in 1869. I saw two stalks of this kind standing a foot higher than the other and of a bright golden-yellow. The heads stand upright, while those of the others lop down. When ripe I gathered it and planted it in my garden. I have sown it every year since with the same good results, always getting a big yield.

"In 1874, if I am correct in the year, I had a 12-acre field of Chevalier, and alongside of it I sowed a piece of this kind of barley. It was sown and harrowed in on the same day, and the same field as the Chevalier. We had no rain that year, and on dry soil all crops failed. The Chevalier was dried up completely. I could not cut it for hay. This new barley was separated from the other by only about two feet. It grew two feet higher and matured a splendid crop of seed.

"I have never heard its name. I find that it yields heavier than any other barley and with more certainty of a crop, stands drouth better, and is adapted to any soil.

"It has less foliage than other barley, and yields crops on poor soil that would not produce common Chevalier. It thrashes as easily as Chevalier. I have never found it damaged by winds or disease or insects. It makes the best of hay. The straw is preferred by cattle to other straw. The stalk is much harder than in the Chevalier, and is not liable to break or lodge.

"If the land is rich and moist, the last of February would be early enough to sow it, as it would make too large a growth if sown early. On poorer land sow earlier. Sixty-five to seventy-five pounds of seed is sufficient to sow on an acre. Its height is from four to five feet. When ripened it turns golden-yellow. I have some standing dead-ripe, still it has not broken down or shattered.

"I sowed last year 5 sacks on the 20th of March, and thrashed 225 sacks of good barley. My soil is not the best, as it is all mixed with alkali. You will notice that the samples which I send you are not as plump as they ought to be. The hot weather following the rain has shrivelled all of the grain in this neighborhood.

"If you would give me, through the Rural Press, its proper name, and other particulars that you deem worthy of mention, you will confer a great favor."

The heads are really beautiful, and differ materially from the Chevalier, although it belongs to the same class, the two-rowed barleys. It has a golden tint which the Chevalier has not, and although the heads are shorter they have the same number of grains, 16 or 17 on each side, and are therefore wider.

Among our German specimens I find two heads of Italian barley, which appear to have all of the characteristics of Mr. Frick's grain, except that being grown in a much moister and less favorable climate they are not so large nor so bright. The "English Cyclopaedia" speaks of the Italian barley as a good stiff-strawed sort, standing well where other kinds would be laid. I will send Mr. Frick a few grains of the Italian, so that he can grow it by the side of his, and I will do the same here on the University grounds. Any differences can then be noted. In the meantime, it would be safe to dub the new comer "Frick's drouth-proof barley."

If we had more such observing farmers, to secure and propagate the choice varieties of grain that appear by accident in our fields, the average results might be vastly improved.

C. H. DWINELLE,

UNIVERSITY OF CALIFORNIA, BERKELEY.

WHEAT AND EGYPTIAN CORN.

[Notes on specimens of Wheat and Egyptian Corn raised in the vicinity of Yolo, Yolo County, California, and furnished to the University of California by Mr. Claude V. Burke, September 12th, 1879.]

These valuable notes were sent by Mr. Burke with very handsome specimens in the head, and liberal portions for sowing:

Chili—Probably among the first wheats cultivated in this section, and is still, with many, a standard variety. Brought from Sacramento County.

Big White Club—For some years this has been a leading variety with our wheat growers, but the last two years it has been more affected with rust than many others, probably on account of the greater length of time required to mature the grain.

Little Club—An old standard sort but little sown now.

Red Sonora—Probably our best variety for late sowing in this locality; matures two to three weeks earlier than almost any other kind raised here. Grain generally well-filled and plump; seldom injured by rust, as it is usually so far advanced as to be safe from injury when other later varieties are "in the dough." If allowed to stand too long in the field it is easily shelled by our northers.

Propo—Early and prolific; a bearded variety that generally brings the highest price for milling. Brought into this county from Sutter, eight or ten years ago, and now very extensively cultivated. Hardly so early as Red Sonora, and probably less hardy if sowed in the fall, seeming difficult to "get a good stand," but when once up, it is also like the Red Sonora liable to shell out by the wind if allowed to stand too long after ripening.

White Sonora—Brought from Tulare County last season by myself and distributed among our best farmers, all of whom, so far as I have heard, are well pleased with it. Ripens at about the same time as Chili, which it resembles very much, though somewhat lighter in color. Stands the "northers" first-rate, and stools well and gives a better yield per acre than its appearance, when standing, would indicate.

Snowflake—Sent to this neighborhood last season by Starr & Company, of Vallejo, but sowed rather late to give it a fair test. The long white grain favorably recommends itself to the millers. Several of our neighbors will sow some of it the coming season.

Red Chaff—I planted $1\frac{1}{4}$ ounces sent me by a friend in Tehama County, and harvested 25 ounces of fine, large, well-filled kernels. Yield 20 for 1 on gravelly hill land.

Defiance—A hybrid of a popular white wheat of the Pacific Coast on an eastern club variety by Pringle, and distributed by B. K. Bliss & Sons, New York, from whom I procured a pound in 1877, divided the pound with a friend, and planted 6 ounces in my garden, from which I harvested 39 $\frac{1}{2}$ pounds. This I sowed on a gravelly loam hill, last fall, which I have just thrashed and find the yield about the same in proportion to the seed planted as the year before. Grain short, round, and plump, something of the nature of our Red Sonora. Heads long and well-filled. Found many heads with five grains in a mesh and twenty to twenty-four meshes to the head. Fear it will shell easily by the wind when dead ripe, as the grain seems loose in the chaff. This is the only variety among twenty-four that was entirely unaffected by rust, when all were planted together in a 5-acre field and cultivated while growing. Have great hopes for its future.

Royal Australia—I procured 4 ounces of this variety from W. A. Burpee & Co., Philadelphia, and sowed it last fall. They represented that it was of the exhibit of wheat which carried off the Royal Prize at the Colonial Exhibition at Adelaide, Australia, in 1877. It is a fine, rich-looking grain, and promises well. Yield, 38 to 1, on gravelly land.

Archer's Prolific—Bearded, and bears close resemblance to Proper or Propo, though my speci-

mens did not ripen so early. Said to have been introduced into this county, from England, by a Mr. Archer, of this county.

Mold's Red Winter—About 8 pounds furnished me by the Commissioner of Agriculture, Washington, D. C., was sowed before the rains on a gravelly, loam hill. After coming up it spread all over the ground, and lay as flat as if it had just emerged from beneath a heavy snow. On the 1st of May it still looked so miserable that one of my men mistook it for wild oats, and mowed it down for hay. It started up again from the stubble, and enough matured to give me 22 pounds, which was harvested on July 16th. This is a new hybrid, and was originated in Kent County, England.

Arnold's Victor—A new variety, of Canadian origin, and furnished by the Department of Agriculture, Washington, D. C. This met with the same accident that befell the *Mold's Red Winter*. It also came up from the stubble, and yielded but 35 pounds from 6½ pounds of seed.

Clawson—Two pounds received from Ohio and planted, promised well until almost ripe, when a "norther" blew out fully four-fifths of it. Heads were good size, berry well filled. Would have yielded well but for the north wind.

Black Bearded—A few heads were found in a neighbor's field 2 years ago, and planted by him in his garden; the result was about three-quarters of a pound yield, which he gave to me for another trial. Planted it with my other varieties; harvested and threshed 19 pounds; yield, 23 to 1. Containing little starch it is of but little use except for feed and macaroni.

Diamond Wheat, or Mammoth Rye—Commonly called "goose wheat." Small package procured from W. A. Burpee & Co., Philadelphia, and planted for the purpose of hybridizing it with a soft, starchy wheat. Yield but 15 to 1.

Hungarian—Was imported from France to Oregon in 1877, by Durbin & Smith, of Salem, from whom I received 30 pounds of seed last fall. It is said, by them, to be first rate flouring wheat, and brings a full price at the Salem mills for milling. The straw is almost solid, and ought to be good for planting where liable to fall from large growth or other causes. Am very much pleased with it, and shall sow it again.

Patent Office—Introduced here several years ago from Department of Agriculture, and still cultivated by many who regard it as one of the best varieties for all purposes. Closely resembles Chili.

Nonpareil—Has been cultivated on our bald hill and plain land with good results. Think it was brought from the San Joaquin Valley 3 or 4 years ago. By some it is claimed to be the Genesee wheat. Withstands the north wind well. Stands up and yields a fine salable grain. Was not affected by rust this season. It is in demand for seed.

Egyptian Corn, White and Brown—The first of this grain was planted but 2 years ago on our spring plowed land, and surprised all of us by its vitality and ability to stand the drouth of our long hot summers. Instead of fallowing for wheat our upland and plains, I think that the time will soon come when this grain will be planted, and thus realize 2 crops in 2 years instead of 1 as now, where summer fallowing is practiced.

RUST.

[A lecture on Rust in Wheat before the State Agricultural Society at Sacramento, September 12th, 1879, by C. H. Dwinelle, Lecturer on Practical Agriculture in the University of California, Berkeley.]

To begin with: What is this rust of which we hear so much as an enemy to the wheat crop? Rust is a fungus; just as truly a plant as the wheat which it grows upon. There are many large fungi with which we are familiar, as the mushrooms, toadstools, and the like, but a large part of them can be seen only imperfectly, or not at all, without the aid of a microscope. Fungi have no flowers and no seeds. In place of seeds there are produced what are called spores; that is, simple plant cells which are capable of growth and reproduction of their kind. These spores are produced in great numbers, and, if visible to the naked eye, appear like dust. Under the microscope they are seen to be exceedingly various in form in different species, and often very beautiful. Fungi are parasites; that is, they live upon other organized matter, either animal or vegetable. Some of them prefer living food, and some flourish upon that which is decomposing. They have not the green color which we usually think of as belonging to a vegetable. That color is produced by a substance

called chlorophyl, which is one of the agents in assimilating the crude material taken up from the earth by plants and fitting it for plant food. As a fungus lives upon organized matter, which has already gone through this process, it has no need of chlorophyl.

The sickly appearance of rusty grain, and the red powder which rubs off from it, are familiar to every farmer, but few have had the opportunity to follow it through its various stages of development. Even among professional botanists there has not been the full knowledge of this subject that is desirable. By degrees, however, order has been brought out of confusion. What were supposed to be distinct species of fungus have been identified as simply different developments of the same thing. When a wheat plant is attacked by rust, yellow spots appear upon the leaves. The cuticle is raised over these spots, as if by pressure from within, so as to give the appearance of more or less elongated pustules. Finally the pustules burst by the splitting of the cuticle. Under a good glass the pustule is seen to be full to overflowing with spores in various stages of development. They are simple vegetable cells, globular, or nearly so, and attached to short stems or pedicels. The younger ones are almost colorless, while the more mature ones are of an orange color. These spores may, under proper circumstances, grow and give rise to other rust spots. As has been said, they take the place of seeds. If the leaf is dissected it will be found that under this mass of spores are many fine filaments, penetrating the substance of the leaf and drawing upon it for the support of the fungus, as the roots of higher plants draw upon the soil. This root-like mass is called the mycelium. This fungus plant which I have described has received the botanical name of *Trichobasis rubigo-vera*, the true red rust of the farmers. Later in the season brown spots may appear upon the rusty wheat, either mixed in with the orange-colored ones already described, or at a short distance from them. These also are fungus pustules, which burst and let loose innumerable spores. But most of the spores differ from those of the *trichobasis* in structure as well as in color. While those had but a single cell and were spherical, or nearly so, these are divided by a partition into two compartments, and are much longer than thick. The plant has been long known to science under the name of *Puccinia graminis*. *Puccinia* refers to the closeness with which the spores are packed in the pustules; and *graminis* simply means *of grain*. This is the "mildew" of the English farmer. It is no wonder that at first "rust" and "mildew" were supposed to be distinct plants. Latterly, as microscopes have been improved and botanists have become more skillful in using them, it has been noted that the same pustules sometimes contain the simple orange spores of the rust, and the double brown cells of the mildew; and what is more, they spring from the same mycelium. In short, rust and mildew on grain are different forms of one and the same thing. When one of the spores of the mildew lodges in a moist place suitable for its germination, it sends out a number of fine, thread-like tubes, from which arise little stems bearing orange-colored spherical fruits. These fruits, in turn, fall off and set up a growth on their own account. It has been thought possible, though I believe not proved, that still another form of fruit or spore may be produced, so much smaller that it may enter the circulation of the wheat through the roots or the small opening in the leaves called stomata.

There has been much discussion and surmise as to whether rust and mildew attacked wheat through the leaves or through the roots, but no very definite conclusion has been arrived at. Some have said that the spores entered the leaves through the air pores or stomata, but it happens that the spores so far known are larger than the pores. As I have hinted, there may be spores, not yet observed, so small as to enter these openings.

From what has been observed in similar plants, it is fair to conjecture that a spore may germinate on a leaf and send out its thread-like tubes into the stomata, and through these tubes transfer its contents to the substance of the leaf, there to give rise to the mycelium or roots which support the perfect plant. This is, however, mere conjecture. Experiments by Professor Fee indicate a probability that the rusts enter the plants which they attack by way of the roots, thence working their way to the stems and leaves. It is very desirable that the matter should be investigated further. If we can decide positively that rust attacks vegetation through the soil, and not through the air, we shall have taken a long step toward deciding whether we can fight it with any hope of success. To know from which direction the enemy is to approach is of vital importance to the general, and no less so the farmer. If we could discard the air as a medium for spreading this pest, and confine our attention to the soil, our task would be reduced greatly. We could more reasonably hope to make some application to the soil which would check this fungus development than to arrest it in its flight on the wings of the wind.

A farmer living on the bottom lands of the Merced River told me of a rather peculiar experience which he had with rust. Water was let into portions of a field too late in the season. The result was that the grain rusted just where the water had been. Of course this was but a common experience. But the next year the grasses and weeds on the same portions of the field were rusty, and this kept up for several seasons, marking out distinctly the course taken by the water. This case suggests, at least, a tainting of the soil by the rusty crop of grain.

Rust injures the berry of wheat by robbing it of its nutriment before it is filled. If it does not appear until the berry is well advanced it is not likely to greatly reduce the yield. If it has reached the dough stage there is little to fear.

Then, again, if the rust is confined to the leaves the grain suffers much less than when the stems and chaff are attacked. Some years ago I was trying farming on reclaimed tule peat land, on Andrus Island, in this county. A neighbor had an extensive and very promising crop of wheat, upon which the rust appeared. Fearing that he was to lose the crop as grain, he set about cutting it for hay. Fortunately he was delayed, so that but little was cut before the grain became plump, and he saw that he was needlessly alarmed. I have known frequent cases where rusty grain has been cut for hay, and the heads have filled while it was curing in the cock.

Our farmers of the interior seem to have become so used to cutting wheat with the header, when dead ripe, that they have forgotten that in the Atlantic States and Europe it is usual to cut it while the grain is still soft, and let it fill in the shock. This method might not be practicable in the warmest sections, on account of the too rapid drying of the straw. Along the coast, on the delta lands, and other moist

regions where the rust is most likely to prevail, cutting early could probably be practiced with profit, if the grain were bound and shocked immediately. It would not only be a safeguard against rust, but would lessen the danger of shelling out in high winds. If the rust is confined to the leaves at the time of cutting, its development is checked by their drying, while the stalks may remain moist enough to feed the head for some time.

There is no doubt that the rust plant is as widely disseminated as the wheat plant. It can almost invariably be found in greater or less quantities when a field of wheat is well advanced. But it does no special harm unless circumstances favor it. Like its larger cousin, the mushroom, rust may develop with amazing rapidity, and utterly ruin a crop which was, but a few days before, the pride of its owner. A healthy wheat plant may be able to resist the attacks of this and other fungi, where one that was weakened from any cause would be destroyed. Anything, therefore, which tends to debilitate the wheat increases the chances of the rust. Among the commonest causes of rust is too great a supply of moisture in the soil. This keeps the roots of the plant cold, while the top may be exposed to a hot sun. The growth may be large, but it is not of the best kind; there is more sap than can be well disposed of, and rust is likely to take possession.

You have often seen such a result after a wet winter or injudicious irrigation. Damp, overcast weather, such as is common along our coast in summer, is also favorable to rust. A field is often rusty in spots on account of a storm, which throws the grain down in those places. The plants are more or less broken, so that the sap is impeded, and the circulation of air not being free it becomes close and favors the fungus. The same conditions of the atmosphere that favor the potato blight, also a fungus, promote the growth of rust. The potato blight first appeared in force in this State a few years ago, after several hot, sultry days. At the time, I was on the reclaimed lands near the mouth of the San Joaquin River, and noted the sudden appearance of rust in hitherto healthy fields. It was specially noticeable where a shower of rain had lodged the grain.

Now I have little doubt that some present have been wishing that I would have done with describing this disease and prescribe some medicine for it. It may as well be confessed, once for all, that we know of no positive cure. The fact that there is a standing reward of \$25,000 in Australia for the man who shall find such a cure is proof enough that it is not known. Our main hope seems to be in what the doctors call constitutional treatment—a general toning up of the patient. There are certain parts of the State where the conditions of climate are so bad that wheat is almost sure to rust. It would be best to give up the crop in such a place and try something else—barely, rye, or oats, for example.

If your land holds the rain water too long, drain it, if you can do so at a reasonable cost. You can find out the probable cost and benefit by trying a small piece first. If you irrigate your grain land, do not put the water on after the usual time for winter rains to cease. The latest experience indicates that it is best to wet your land in the fall, plow and sow early, and then trust the rains.

There is one method of avoiding rust in wheat which is unquestionably good. There are certain varieties of wheat which are much less subject to injury from its attacks than others. By sowing them

we can greatly diminish the chances of loss. Several have already considerable reputation in this State, but do not seem to be as widely known as they deserve. The Odessa wheat is highly commended by the farmers of our southern coast, particularly about Anaheim and other places in Los Angeles County.

They tried it at first in a small way, and were so well pleased that this year several large crops are reported. I had a little plot sowed with it in our experimental garden at the University last winter, and it has fully borne out its reputation as withstanding rust. There were only a few stalks that showed any traces of the fungus, and those had not enough to injure them. Almost all of the other wheats in the garden were rusted to some extent, and some were entirely ruined. The grain is not one that would by its appearance attract a farmer who has been in the habit of raising the large white varieties. It is rather under-sized, judged by the California standard, and of a dark amber color. There was an impression at first that it would not sell well, but there was a sale of a considerable quantity reported in San Francisco a few months ago, at full rates for milling. A farmer and former miller who happened to be present when the matter was under discussion before the class in agriculture last winter, examined the grain, and expressed the opinion that it would make good flour. It may not prove as good in the interior as on the coast. Possibly it might shell badly in the dry northers which sometimes blow in the great valleys at harvest time. Those who live in a rusty section would do well to give it a trial.

There is a variety known as Siberian wheat which is also said to be little affected by rust. The grain growers in parts of Contra Costa County commend it highly on this account. I cannot speak of it from any personal experience. There are undoubtedly many other wheats that are unusually hardy in this respect. Farmers may do the State great service, and reap profit themselves, by watching their crops closely in this respect. There is very little seed wheat sown that is not more or less mixed. Sometimes, when the main part of a crop is rusted, a few plants from another kind of seed will be unharmed and yield well. Such exceptions should be noted carefully, and the hardy grain saved, if it is not of a common kind. The College of Agriculture has about 50 kinds of wheat on exhibition here at the State Fair. Most of these have just arrived from Europe. They will be carefully tested on the University grounds, and special attention given to their rust-resisting powers. We hope to find some among them of decided value in this respect, as well as in others.

We can assure you that we have a first-class climate for rust, if not for wheat. Any kind that will resist it there, should be pretty safe in other parts of the State. When we have secured enough for the purpose, we intend to distribute the grain for seed among the farmers of the State. We also have about as many more varieties of barley, rye, and oats. Farmers will do us a favor by sending in their names, and stating what class of grain they wish for. They will be supplied as soon as circumstances will admit. As a general rule, the early grain is less likely to rust than that which comes later. This is because it is not in the tender juicy state when the warm weather comes on.

There is a statement on record that a German farmer succeeded in protecting his wheat from rust by a dressing applied before sowing. "About six hours before sowing, he prepared a steep of three

measures of powdered quicklime, and ten measures of strong brine. Two quarts of this he poured on a peck of wheat, stirring it with a spade until every kernel was covered and white with the preparation." Such a dressing should kill the spores on the grain and give it vigor to resist disease. Various washes and other applications are made to the seed wheat before sowing. Most, if not all, of these must be set down as still in the experimental stage. Their value must depend mainly on the solution of the question which I have spoken of: Does the rust-plant gain access to the wheat through the ground or through the air? Soaking in a weak solution of carbolic acid is one of these prescriptions.

This whole subject is a serious one, and beset with many difficulties. We should not be hasty in drawing conclusions from one or two experiments, whether they be favorable or otherwise. Careful investigation has solved problems that seemed as difficult as this. We should all assume the position of students. This brief lecture was intended simply as an introduction to a discussion in which I trust all practical farmers will feel free to take part and give us the benefit of their experience.

SYNOPSIS OF A COURSE OF LECTURES ON DAIRY HUSBANDRY.

[Delivered at the University of California during September and October, 1879, by Edward J. Wickson.]

The history of dairy husbandry.

Methods in vogue among the ancient Hebrews.

Those of the Scythians as compared with rude practices in Brazil, Arabia, and elsewhere at the present time.

Contrast of these methods with those now practiced in America and Europe, showing the marvelous progress attained.

Growth of the cheese interest in this country.

The spread of the factory system.

The increase of exports from 1,000,000 pounds in 1821 to 123,900,000 pounds in 1878.

How this great increase was attained.

Natural adaptations to dairying.

How unfavorable conditions may be overcome.

Commanding position attained by the product of new regions in the old markets.

The dairy interest in California.

The importations of the early days.

Statistics of the great home product of to-day.

The same compared with the values produced by our other special branches of agriculture.

The adaptations of California for dairy husbandry.

Definitions of our four great dairy districts.

Characteristics of each in growth of pastures and forage crops.

Climatic conditions in each, and effects produced thereby.

The necessity for distinctive systems of dairy practice.

California shown to possess dairy qualities corresponding to those of all the famous dairy regions of the world.

Vicissitudes of dairying in California.

Early instances of large profits from the industry.

The subsequent temporary decline.

Revival and steady increase thereafter.

Contrast between the advancements of the cheese and butter interests.

Production of each now fully adequate to the demand.

Attempts to introduce California dairy products in foreign countries bordering on the Pacific.

The great need of progress in this direction.

The position of the dairy among other agricultural specialities.

Involving several branches of husbandry, it calls for the fullest knowledge and skill.
Problems still awaiting solution.

The necessity of careful and systematic experiments, to determine best practices and materials.
The field thus open to young men trained to observe and make correct deductions.

The effect of dairying upon fertility in soils.

The drain upon soil-strength by grain, fruit, and vegetable growing,

The compensations existing in a wise system of dairying.

Effects of grazing and dairying compared.

Matters taken from the soil by different styles of dairying, for milk-selling, for butter, and for cheese.

Small amounts of mineral constituents required by each, as shown by analysis of marketed product.

Ease and cheapness with which these can be returned to the soil.

Restorative action of dairying upon soils worn by cropping.

The dairy cow.

Contrasted with cows handled in a grazing system; also with wild cows, as of the buffalo and bison.

Outward marks of excellence in dairy cows: 1. Disposition and action. 2. Form and size.

3. Special marks and features.

Points of excellence in different dairy breeds.

The "Escutcheon" theory of Guenon defined and illustrated; the "milk veins," etc.

General review of points to be chosen and those to be rejected.

Feeding for milk production.

The twin influences of feeding and breeding, and what may be expected of each in the improvement of dairy stock.

The necessity of selecting cows which are able to make good use of the feed.

Wide individual variation in this respect.

How to determine which cows are yielding profit and which are kept at a loss.

The philosophy of feeding.

Food of support and food for production.

Reasons why these should be generous and complete.

The phenomena of animal nutrition.

Carniverous and graminiverous animals compared.

The chemistry of changes in the material from plant to flesh and milk.

The wisdom of special feeding, as shown by the best dairy practice.

Limitations affecting special feeding.

Effects of certain foods upon quantity and quality of milk, as shown by many and careful experiments.

Quantity increased and quality improved by rations of bean meal, palm nut meal, bran, mill feeds, etc., added to hay and grass; these feeds being rich in albumenoids.

Milk unaffected by increase in the amount of starchy matters.

Influence of foods, rich in oily matters.

Influence of alfalfa and other clovers. Effects of these plants at different stages of growth.

General lessons of experience concerning the feeding of dairy cattle.

The udder and its function.

Anatomical structure of the udder (illustrated by dissection).

Descriptions of the parts of the udder, the main glands, and their canals, reservoirs, ducts, lobules, and acini, and the form and structure of each shown with the aid of the microscope.

The formation of milk and the parts participating therein: the heart; the arteries; the capillaries; the acini; the lobules; the ducts; the reservoirs; the canal of the teat; the milk pail.

The special arteries carrying blood to the udder, and the veins which return the unused parts to the heart.

The nerves of the udder.

Variations in size and form of udder and its parts in different breeds and individual cows.

Practical deductions therefrom.

The art of milking.

The right way and the wrong way.

Good and bad influences exerted thereby.

The influence of the human hand upon the development of the milking function.

The attempt to draw milk by various devices, and the failure resulting.

How the cow "holds up" her milk.

The need of quiet and gentleness during milking.

The imperative necessity of cleanliness of milker and surroundings.

Times of milking.

Importance of regularity and reasons therefor.
 Influence of thrice a day milking; when desirable.
 Milk yield as affected by frequent milking.
 Comparative quality of night's and morning's milk.

Milk—Definition.

Characteristics of milks of different animals.
 Chemical composition of cow's milk.
 Limits of variation in composition, as shown by analysis and by dairy practice.
 Specific gravity of milk, and how far it may be taken as an indication of quality.
 Standard sp. gr. in New York City, and instruments approved for testing.
 The lactometer in the Health Office, in the Court-room, in the cheese factory.

Physical composition of milk.

The butter globules (shown with the microscope); their composition and size.
 Globules from milk of different dairy breeds compared.
 Are the globules cellular in structure? Points cited favoring affirmative and negative.
 Weight of evidence apparently indicating that the globules are cells and enclosed in an envelope.

The formation of milk.

Different views: 1. By decomposition of the cells of the acini and by fatty degeneration.
 2. By exudation or straining from the blood.
 Evidence that both these methods are in operation.
 Bearing of the subject of formation upon dairy practice.
 Characteristics of milk at different times after calving.
 The colostrum; chemical composition and microscopical appearance.
 Why unfit for use or dairy manufacture.
 Decrease in size of globule with the advance of the milking season.

Rising of cream.

Philosophy of the movement.
 Effect of temperature upon it.
 The Swedish system of "cold setting." American adaptations of the system.
 "Deep setting" and "shallow setting;" conditions which favor each method.
 The use of large and small pans.
 The novel devices for extracting the cream by centrifugal force.
 Great advantages of this method, if found fully practical.
 Experience thus far with centrifugal creaming machines.

Butter-making.

Enumeration of the fats in butter, and their characteristics.
 Their influence upon taste and aroma of good butter.
 Results of their decomposition, and the ways in which it may be induced or prevented.

Philosophy of butter-making.

Separation of fat globules from the other constituents of the milk, and congregating them in mass form with least possible change in their physical condition.
 The operation purely mechanical, and should be attended by the least possible chemical change in the materials employed.
 These principles illustrated by reference to conditions of success in practice.

Condition of cream for churning.

Sweet or sour—influences imparted to the product by each condition.
 Temperature required, and results of working cream at a wrong temperature.
 Uniformity necessary in all parts of the mass. Influence of "curing the cream."
 Danger of adverse conditions generating in the cream jar. Necessity of perfect cleanliness.
 Degree of fluidity requisite.

Churning.

Causing the globules to congregate by friction or concussion, and condition produced by each.
 Reasons why concussion is the true method.
 Methods by which concussion is secured in several styles of churns now in use.
 Quality of butter as affected by churning.

Gathering the butter.

Old and new methods.
 Gathering in grains and "washing" in the churn.

Buttermilk thus removed without "working" the butter.

Butter brought upon the "worker" in small particles and "worked" only enough to distribute the salt evenly.

Rules to be observed in salting.

Effect of this method upon consistency and keeping qualities of the butter, also upon its "grain."

The "grain" of butter.

Definition of the term.

Necessity of preserving the grain instead of breaking it down into a salvy mass.

Appearance of butter of each kind—illustrated with samples.

"Creamery" butter.

Description of buildings and appliances best adapted to making butter on a large scale—illustrated with plans and engravings.

Position of creamery butter in the eastern markets and reasons for its eminence.

Large butter dairies of California compared with eastern creameries.

Canned butter.

The great business at the East and in Denmark in canned butter for the tropical markets and ship use.

Advantage of such an industry to California dairying.

Description of canning process and conditions of success.

Packing butter.

Suggestions concerning proper packages.

Conditions requisite in the material.

Points to be observed in packing.

The "pickled roll" butter of California.

European experiments on the preservation of butter.

"Working over" butter.

System of collecting miscellaneous lots and "doctoring" them to secure uniform masses.

Attempts in this direction in the Western States.

Great skill of the French butter doctors and their shipments to London.

The result of "working over" very unsatisfactory, as compared with the product of central factories, taking cream from numerous dairies.

Methods for "resurrecting" rancid butter.

Causes of bitter tastes in butter.

Effects produced by feeding unaccustomed food in too large quantities.

Effect of some forage plants at some stages in their growth; also of weeds, etc., in pastures.

Results of unclean surroundings, or of incorrect treatment of good materials.

Methods by which bitter flavors may be obviated.

Oleomargarine.

Method of manufacture and materials employed.

Large amounts made and exported.

Microscopical appearance as compared with butter.

Not to be considered a rival of good butter, but superior to poor grades.

General improvement of quality in genuine article necessary to rule out the imitation.

Marketing butter.

The importance of style as well as quality.

Necessity of making shipments uniformly good.

The wisdom and profit in establishing a distinctive brand, as illustrated in California and at the East.

Need of opening new markets for the California product.

General recapitulation of important points in butter-making.

Cheese-making.

Antiquity of cheese.

Great number of kinds of cheese made from milk of cows, sheep, goats, asses, etc.

Descriptions of principal kinds.

Vegetable cheese made from casein of beans, peas, etc.

Composition of cheese.

Average chemical composition of American cheese.

Composition and structure of cheese, as shown with the microscope.

Variation both in chemical and physical composition according to materials employed or methods of manufacture.

Process of cheese-making.

- The cheese vat, the "steam vat," and the "self-heater."
- Mechanism of each explained with drawings.
- "Setting" the milk; temperature chosen and reasons therefor.
- Introduction of the rennet; origin and nature of rennet; points to be observed in its preparation; what is known of the nature of its action.
- Progress of coagulation in the milk, and in what it consists.
- Cutting the curd and reasons therefor; when the curd is fit to cut.
- Separation of the whey, and points to be observed in securing it.
- "Cooking" the curd during the separation.
- General remarks on the effects of heat in cheese-making.
- Development of acid in the curd; tests to detect it.
- The "no-acid" process.
- Different methods of handling the curd after the removal of the whey.
- The cheddar process and its modifications.
- What is known as the "American process."
- Lifting the curd; the "curd sink;" the "curd mill."
- Their offices explained and the results attained by them.
- Salting the curd.
- Pressing and bandaging; different appliances and materials employed.
- Curing cheese; in what it consists.
- Necessity for proper curing-rooms and how to build them.

The cheese factory.

- Plan of building (diagrams).
- Description of interior apartments and what is desirable and what objectionable in them.
- General notes on the system of "associated dairying."

Cheese-making with imperfect milk.

- Process employed to overcome taints in the milk.
- Comparative freedom from taints in this State.
- Manufacture of cheese from skimmed milk.
- Changes from process with "whole milk."
- Proposed introduction of cheap oils to take the place of cream.

Cheese as food.

- Valuable as a "strong" food for hard labor.
- Its use instead of meat in Europe.
- Cheese as an army ration.
- Occasional cases of poisonous cheese and what is known of the causes thereof.
- Introduction of foreign styles of cheese to stop importation.
- California "Swiss cheese," "Limburger," etc.
- Description of other styles which might be introduced.

Hints on marketing cheese.

- The abuses in the trade.
- Boxing cheese as practiced in some California dairies.
- Necessity for foreign markets before the industry can be profitably developed in this State.
- The advantage of a reputation and a recognized brand.
- Closing remarks on the chance for young men in dairying, and the spirit which should inspire their efforts.

INVESTIGATIONS ON THE ABSORPTION OF HYGROSCOPIC MOISTURE BY CEREAL GRAINS.

[Abstract of Graduating Thesis of Edmond O'Neill, College of Agriculture, University of California].

It has been known for a long time that grain absorbs moisture from the atmosphere. In California this fact is particularly noticeable. The bulk of the grain crops is raised in the interior of the State, and generally stored there for some time. During the summer the grain will lose nearly all its moisture; and when removed to the damp warehouses of San Francisco, or shipped to a foreign port in the hold of a vessel, where the atmosphere is nearly saturated with moisture, the weight is materially increased. It has been said that this increase will pay the entire cost of freight from San Francisco to Liverpool.

Several instances of this absorbent power have been noticed. A writer in the Pacific Rural Press mentions the fact that the *lower* sacks stored in a warehouse gained a considerable amount. The reason was that the moisture coming from below was almost completely absorbed by the lower layers, none being left for the upper ones. Another person mentions that the outside sacks of a pile of freshly threshed grain standing in a field for ten days weighed 30 pounds less than the inner ones. Freshly threshed grain always contains moisture; and it the loss of this which caused the difference. Ten days was not sufficient to allow the inner layers to lose all their moisture.

Many inquiries having been made as to the actual amount that could be gained or lost, and to whom the profit went, experiments were made to determine these points. It would be important to the farmer to know whether it would be profitable to store his grain or sell it off the field; whether the commission merchant should take the farmer's weight or to weigh it himself. All these points are of the greatest practical consequence to the farmers of our State.

The amount of absorption may be measured in several ways. The best method, and the one that was used, was Schübler's, as modified by Professor Hilgard. The grain was placed on a small table standing in shallow water, and the whole covered by a bell jar, which was made as low as possible. The grain was spread out in a very thin layer and surrounded, though not touched, by filter-paper dipping into the water below. Even with these precautions for maintaining a moist atmosphere the grain will continue to absorb for a period of from 12 to 18 days.

Since temperature changes the amount of water in a saturated atmosphere very much, the apparatus was placed in a room where the temperature was nearly constant, viz., about 18° Centigrade, or 64.4° Fahrenheit.

Experiments according to this method were made with wheat, barley, and oats. About 25 grammes ($\frac{5}{8}$ ounces) of each were employed, spread out on large watch glasses. The weighings were made in a corked flask, as the grain lost weight rapidly when removed from the apparatus. The absorption was accompanied by considerable swelling, which, however, was not measured.

The following table shows the percentage of moisture absorbed by the air-dry grains from a saturated atmosphere at 18° C.:

TIME.	Oats.	Differences.*	Barley.	Differences.*	Wheat.	Differences.*
Eight hours -----	3.80	7.79	3.52	7.00	3.26	6.56
Fifteen hours -----	5.00	.56	5.54	.54	4.11	.46
Twenty-four hours -----	7.79	1.85	7.00	2.54	6.56	1.55
Forty-eight hours -----	8.35	1.20	7.54	1.70	7.02	1.2
Sixty-four hours -----	9.53	1.00	8.68	1.30	8.00	1.3
Five days -----	12.43	1.00	11.44	1.30	10.50	1.7
Five and a half days -----	12.68	.97		1.27		1.3
Seven days -----	14.37	.50	14.00	.60	13.05	.63
Nine days -----	15.21	.34	15.10	.50	14.18	.50
Twelve days -----	17.35	.82	18.52	1.21	17.40	1.2
Fourteen days -----	17.88	.71	19.70	1.34	18.79	1.0
Fifteen days -----	18.57	.60		1.01		1.2
Eighteen days -----	19.76	.32	20.38	.43		0.27

* The differences are calculated for periods of 24 hours.

We see that although the total amounts absorbed by these grains differ slightly, yet they seem to follow the same general law; *i. e.*, a gradual increase—at first very rapid, and then slowly becoming less until about the thirteenth or fourteenth day, when a sudden increase occurs. This is due to the development of mold caused by the great amount of moisture present. Nearly half the total increase occurs in the first twenty-four hours, and most of it in the first part of this time, as shown below:

DIFFERENCES BETWEEN INTERVALS OF FIRST TWENTY-FOUR HOURS.

	Eight hours.	Fifteen hours.	Twenty-four hours.	Total absorbed.
Oats -----	3.80	1.2	2.79	7.79
Barley -----	3.52	2.02	1.46	7.00
Wheat -----	3.26	.84	2.45	6.56

The columns of differences, as before, refer to periods of twenty-four hours.

In the second twenty-four hours scarcely anything was absorbed—probably owing to a sudden change of temperature.

The amount of water in the air-dry grains used, was also determined. They were exposed to a perfectly dry atmosphere at + 18° C. The apparatus employed being a common sulphuric acid desiccator. The grains, especially the wheat, shrank very much, and became hard and horny. The results were as follows:

PERCENTAGE OF WATER LOST BY AIR-DRY GRAIN EXPOSED TO ABSOLUTELY DRY ATMOSPHERE AT $+18^{\circ}$ C. (64.4° FAHRENHEIT).

	Oats.	Differences.	Barley.	Differences.	Wheat.	Differences.
Two days -----	4.45	{ 3.00 1.45	3.39	{ 2.00 1.39	3.11	{ 2.0 1.11
Three days -----	5.67	{ 1.22 0.86	4.41	{ 1.02	4.18	{ 1.07 .45
Four days -----	6.53	{ 0.42 0.48	5.20	{ .8 .31	4.63	{ .35 .20
Five days -----	6.95	{ 0.36 0.35	5.51	{ .35	4.98	{ .11 .7
Six days -----	7.43	{ 0.20	5.86	{ .28	5.00	{ .5
Seven days -----	7.99	{ 0.19 0.16	6.14	{ .24 .20	5.11	{ .3 .28
Nine days -----	8.14	{ 0.13 0.12	6.55	{ .21 .20	5.18	{ .05 .20
Eleven days -----	8.53	{ 0.12	6.96	{ .19 .16	5.46	{ .18
Twelve days -----	8.69	{ .10 .09	7.13	{ .12 .12	5.51	{ .18 .14
Eighteen days -----	9.32	-----	7.79	{ .10 .09	6.23	{ .01

There is a gradual decrease, more rapid at first as seen by the table of differences. About half is lost in the first two days.

According to the above determinations, perfectly dry grain, exposed to a saturated atmosphere, will absorb the following amounts at $+18^{\circ}$ C.:

Oats -----	29.08 per cent.
Barley -----	28.17 per cent.
Wheat -----	25.02 per cent.

Wheat is thus seen to be less hygroscopic than oats or barley. Perhaps this difference is owing to the chaff of the latter.

As the temperature of the interior of the State in summer is about 80° Fahrenheit, the experiment of drying the grains at this temperature was tried. The grain was placed in a flask, which was kept at a temperature of 30° C., ($=80^{\circ}$ Fahrenheit), by means of a water bath, and dry air passed over. The results were as follows:

Temperature, $+18^{\circ}$ C.; time of exposure, 18 days (432 hours); per cent. lost, 6.23.
 Temperature, $+30^{\circ}$ C.; time of exposure, 30 hours; per cent. lost, 7.65.

This shows that an increase of temperature increases the amount of moisture lost and decreases the time required for desiccation.

The air, even in the interior of the State, is never absolutely dry. According to Logan, the average dew-point of the Sacramento Valley in summer is 50 , the temperature being about 70° Fahrenheit. This shows that the air contains 39.37 per cent. of moisture. The annual average dew-point is 48, the temperature being 61° Fahrenheit. This corresponds to 52 per cent. of moisture. Experiments were made with air of this degree of saturation. This was done by means of a solution of chloride of calcium. According to Guy Lussac, the tension of aqueous vapor formed by a solution of chloride of calcium of the specific gravity 1.343 at 10° C. has a tension of 50.5, the tension of aqueous vapor in a saturated atmosphere being taken at 100. In other words, the air above such a solution is half saturated. Since

a solution at 18° (the temperature used), is less dense than at 10°, a correction must be made. It was assumed to decrease in the same ratio as in the case of pure water; and, therefore, a solution of specific gravity 1.3418 was employed. Wheat was placed over this and surrounded by moistened filter paper as before. The amount absorbed by wheat dried at 30°, from a saturated atmosphere and from a half saturated one, is shown below. Amount absorbed in 12 days, temperature + 18° C.:

Over solution of chloride of calcium	3.40 per cent.
Over water	22.9 per cent.

This result shows that air, *half saturated*, acts almost like *dry* air; and, therefore, that wheat from the Sacramento Valley may be considered as being almost absolutely dry, and hence capable of taking up 20 per cent. or more of moisture from sea air.

It is thus obvious how important a factor the absorption of moisture is in the case of grains. The great bulk of our wheat may be considered as dry during the summer, and on transportation to a damper climate may, *possibly*, increase 25 per cent., while a gain of 5 per cent. to 15 per cent. may be looked for with almost absolute certainty. This is clear profit, and might as well be appropriated by our farmers as by the commission merchants or foreign dealers.

Further experiments are necessary to determine the amount of moisture in newly thrashed grain, and the rapidity with which it is lost in the field or warehouse during summer; the effect of one-quarter, three-quarters, or other intermediate degrees of saturation; the influence of large and small piles; and whether the difference of absorption of different grains is not due to the chaff. The determination of these points, and also of the degree of saturation of the air of the warehouses of San Francisco, and of the grain-growing regions, will enable us to estimate very accurately the amount of moisture actually absorbed by the cereal grains in their transit from the farmers' hands to those of the Liverpool buyers.

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